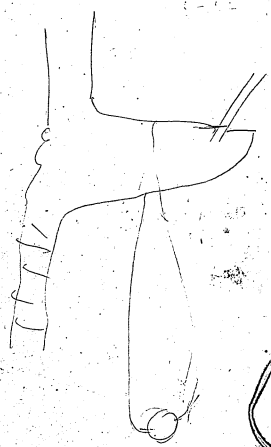
Menlo Park Notebook #238 [N-82-06-21]

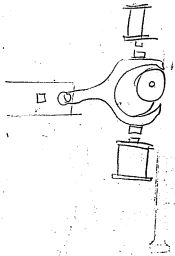
This notebook covers the periods June-August 1882 and May 1885. The entries in the first part of the book are by Edison and John Ott. Included are notes and tables relating to tests of a current regulator, tests of the conductivity of various elements in glass tubes, and tests of meters. There are also notes on filament experiments and calculations by Edison regarding costs of power plants. The entries in the second part of the book are by Edison and a laboratory assistant with the initials "M. W." There are notes by Edison on experiments to find a new form of energy, along with notes and tables of storage battery tests. The label on the front cover is marked "Cable." The book contains 280 numbered pages.

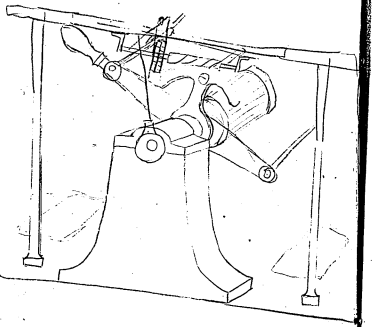
Blank pages not filmed: 82-93, 116-121, 126-132, 141, 148-149, 154-155, 276-279.

Missing page numbers: 1-40, 123-124, 133-140, 277-278.

×E-172 N-82-06-21







June 21, 1882

Tested Weber current regulator with two levers all being acted upon by one magnet, each lever short circuiting twelve ohms resistance in field circuit.

Set galvanometer so as to give a deflection of 20. $\frac{mm}{m}$ with two cells of battery, each 1.079. Volts

Battery sent lamps from 45 to 1

Deflection	Volts	Equalizer	Dif
177	92.2	89.0	4.96
177	92.2	89.0	
177	92.2	89.0	
177	92.2	89.0	
177	92.2	89.0	
169	91.1	89.0	
168	90.5	89.0	
167	90.0	89.0	
166	89.5	89.0	
165	89.0	89.0	

Table of Deflections, second Test Weber current regulator June 21. 1882. each lever cutting out the following resistance

Levers	Ohms	Def	Dif
1	8	159	
2	12	155	6
3	12	154	1
4	12	154	0
5	12	153	1
6	12	149	4
7	12	149	0
8	12	150	1
9	12	147	3
10	10	158	11

Greatest Dif 11 mm

John. F. Ott.

Volts	Dif	Plugs in	Plugs out
85.42		171	177
83.63	2.99	173	182
83.09	0.54	167	185
83.09	0.00	163	188
82.55	0.54	160	188
80.39	2.16	159	189
80.39	0.00	159	192
80.83	0.44	157	189
79.27	1.56	156	187
85.28	6.01	161	178
		172	175
			183

Greatest Dif 6.45 Volts · equals about 7.5 Candel power

June 21. 1882

Tested the same direct in line Magnet connected in Multo arc

Plugs in	Plugs out
185	181
179	186
182	190
184	193
170	196
170	194
169	192
175	192
181	181
190	179
181	185

June 23. 1882

Tested regulator with two brushes right angle to others, or nearly so. allowing a slight potentials higher on one side than the other side causing a current to flow across brushes in field circuit. I find that mutual line changes proportional to load or nearly so, But the bridge as arranged is constant and does not change potentials proportional to load as following table will show.

1	2	3	4
Def	Def	Def	Def
185	182	179	166
189	186	182	167
192	189	184	167
195	192	186	167
197	195	187	165
200	198	187	
201	199	187	
201	200	187	
199	197	182	
196	196		
185	190		
167			
This dropped to 20 lamps to nothing.	dropped to 25 lamps	dropped at 25 lamps	dropped at 65 lamps
	Changed brushes slightly		

55 after

40

12 after

5

17 after

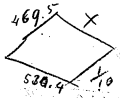
22

47.	55 Lamps
47.	55 "
50	45 "
50	45
65	35
65	35
1.05	25

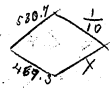
June 27, 1882.

Continuation of Experiment June 27. 1882 with Brass brushes

Resistance of leading wires Jump



0.08858696



0.08843040

0.08848358

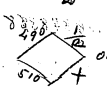
0.0945526 Brushes stopped

0.0947419

0.0949312

0.833333 Motion

0.676871



0.520408

0.094742

0.582129 Diff

very unsteady, cuts but not so much as with copper brushes

0.0981375 Brushes stopped

0.962127

0.0942879

0.120754 Motion

0.150825

0.188899

0.096213

0.056612 Diff

very unsteady

III Zinc

Motion 0.102213
Stopped 0.095618
0.006595 Diff

1983 Revol.

Not so unsteady, as I and II

IV Babbitt

Stopped 0.101902
Motion 0.096369
0.005533 Diff

1983 Revol

Resistance of brushes stoped higher

Quite steady

V Lead

Motion 0.102827
Stoped 0.097297
1983 Revol. Diff — 0.005524

VI [redacted]

Phosphorbronze.

Motion 1.017556
Stoped 0.106697
1983 Rev. Diff 0.910859

Extremely steady

Wires alone 0.09029518

VII Steel

1883 Revol Stopped 0.147651

Measurement during motion impossible
larg outside current perhaps on
account of magnetic induction

~~Steel~~

VIII Copper

Motion 0.096950
Stoped 0.093518
Diff 0.003432

1883 Revol

Eider

IX Tin

Motion 0.338075
Stoped 0.095944
Diff 0.242131

1883 Rev

First measurement during motion increasing resist,
Second resistance increases horribly

X East Iron

Motion 0.171962
Stoped 0.131750
Diff 0.040212

1883 Rev

Very unsteady

June 28. 1882 Wires alone
0.089358

XI German silver

Motion 0.108145
Stoped 0.100200
Diff 0.007945

1870 Rev

XII Nickle

Motion 0.111227
Stoped 0.098118
Diff 0.013109

1870 Rev

Very unsteady

~~Steel~~

XIII Bonanza Metal

Motion 0.479433
Stopped 0.100062
1870 Rev Diff 0.379371
Very unsteady

XIV Extra Zinc Babbitt

Stopped 0.102430
Motion first measurement 126.571450
Second 0.077936,
The observation were correct, the result is nonsense

Wire alone 0.110505
Resistance increase without doubt by heat and perhaps dust

Claudius and John F. Ott.

Amalgamated Copper brushes and Metals

I Tin and copper

Verry verry good

brushes stopped	0.0915344
Motion	0.0915527
Diff	0.0000183

II Yellow Metal

verry good

Stoped	0.0912230
Motion	0.0914429
Diff	0.0002199

III Zinc

unsteady

Stopped	0.0912961
Motion	0.0948559
Diff	0.0035598

IV Babbitt

Verry unsteady

Stopped	0.0926969
Motion	0.1065777
Diff	0.0138808

V Lead

Verry unsteady

Stopped	0.0926782
Motion	0.1513332
Diff	0.0586550

VI Phosphorbronze

Verry unsteady

Motion	0.0944491
Stopped	0.0941162
Diff	0.0036329

~~German Silver~~

VII Steel

same as I

Stopped 0.0921414
Motion 0.0920493
Diff 0.0000921 !!

The resistance becomes smaller by the motion though very steady

VIII Copper

very unsteady

Stop 0.0920308
Mot 0.0924006
Dif 0.0003698

IX Tin

very unsteady

Stop 0.0958894
Mot 0.1228907
Dif 0.0270013

~~Steel~~

XI German silver

very unsteady

Stop 0.0922157
Mot 0.0979684
Dif 0.0057527

XII Nickle

very steady

Stop 0.0924929
Mot 0.0927902
Dif 0.0002973

Bonanza Metal

very steady

Stop 0.0932507
Mot 0.0930152
Dif 0.0002345

Extra Babbitt

Only metal giving an steady current

Stop 0.0978930
Mot 0.1587649
Dif 0.0608719

~~Brass file~~

Wires alone 0.0908038

June 28. 1882

Wires alone 1st measurement
0.089358 Ohm
later 2.nd 0.110505 "
Wires perhaps dusty at the end
also warmer than before.

Charcoal Iron brushes
nothing amalgamated

I Tin and Copper

1988 rev Mot 0.109388
Stop 0.103293
very strong Diff 0.006095
outside current

II Yellow metal

Mot 0.116591
Stop 0.102041
1988 rev Diff 0.014550

III Zinc

Mot 0.163348
Stop 0.102225
very unsteady Diff 0.061153

IV Babbitt

1988 rev
unsteady

Mot 0.108848
Stop 0.103562
Diff

V Lead

Mot 0.114154
Stop 0.101410
Diff 0.012744

First measurment steady
second steady

VI Phosphorbronze

very unsteady

Mot 0.145592
Stop 0.103812
Diff 0.041780

VII Steel

Stop 0.106292

During motion a large outside current made every measurement impossible

VIII Copper

1988 rev
unsteady

Mot 0.109454
Stop 0.102635
Diff 0.006119

Wires alone 0.0090657

June 29th 1882

Wires alone 0.0885907

IX Tin

Resistance increasing surface covered with oxide 1815 rev.

Mot 0.354384
Stop 0.121362
Diff 0.233025

X Cast Iron

very unsteady
1830 rev

Mot 3.282848
Stop 2.711855
Diff 0.5710023

XI German silver

1830 rev

Mot 0.122822
Stop 0.111126
Diff 0.011696

XII Nickle

very unsteady

Mot 0.296334
Stop 0.120706
Diff 0.175628

XIII Bonanza metal

very unsteady only on account varying resistance

Mot 3.255460
Stop 0.105444
Diff 3.150016

XIV

Very unsteady

Extra Zinc Babbitt

Mt 0.506694
Stp 0.105066
Diff 0.401628

H Claudius
and
John F. Ott.

74 page 19 June 9. 1882
July 27. 1882

Tested regulator on page 40. and found it works very well,

Taken the following deflections then regulated the lights at Mr Edisons house and found them regulated [illegible].

On page 75 will be found table of Def and Volts

Deflect	Volts	Deflect	Volts
165	89.5		
164	89.	175	95.1
168	91.2	174	94.5
165	89.5	174	—
168	91.2	174	—
166	90.1	174	—
168	91.2	173	93.9
169	91.8	172	93.4
170	92.3	172	—
172	93.4	171	92.8
172	93.4	171	—
172	dido	170	92.3
173	93.9	170	—
173	—	169	91.8
173		168	91.2
		167	90.7

This is from 77 lights to 5

Difference 4.4 Volts

This is from 5 to 77

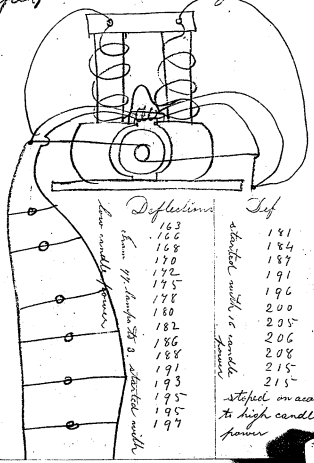
Diff 4.3 Volts

There being a slight drop in the line, that is probably bring it down to 2 Volts

July 31. 1882.

Tested and found to regulate imperfect

John. F. Ott.



Deflections	Def
.163	181
.166	184
.168	187
.170	191
.172	196
.175	200
.178	205
.180	206
.182	208
.186	215
.188	215
.191	stopped on account
.193	to high candle
.195	power
.196	
.197	

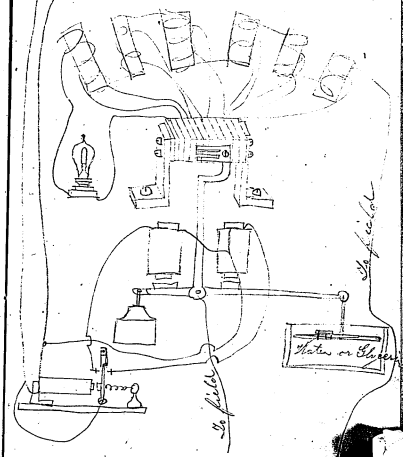
Low candle power when 17 lamps 20 ω. started with

started with 16 candle power

July 20. 1882

Main

Main



Aug 1. 1882

Tested regulator on page 79. and found it the best, that I saw. there being no sparking on Commutator

Def		Volts
174		94.5730
174		—
174		—
174		—
174		—
175		95.0525
175		
175		
175		
175		
175		—
175		—
175		—
175		—

Lamp 40 c
life 600 h
burns 3000 cf. at $2 6
profit. $3 ~~600~~
Ed

plant cost. 16 per lamp installed.
16 water
$32 at 322.
3

10 pct.

21000
2,600000

14000
16
84000
14000
224000.

14000
20
280000.
4 | 560000.
2 | 140000
4
560000

14000.

14000.

140000

20
42

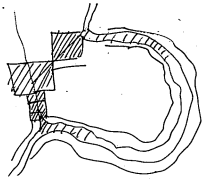
14 | 100,000 | 71.43
98
20
14
60
56
40.

15

200 | 8500 | 42
800
500
400
100

14000
71
40000
98000
994000

Cost plant

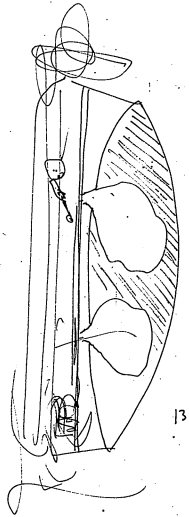


50.

85
2
170

5250
13
15750
5250
6825
50

40000 | 341,250
850 | 40000
34,000,000



100

13.

4 450.
2450.
5000
10500.

6000
8
48000.
30

39.
45

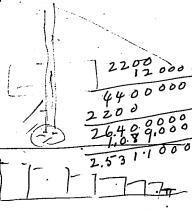
75.

20.
50.750
70
40000
1440 3850.00
6000.

300 | 6000
20.

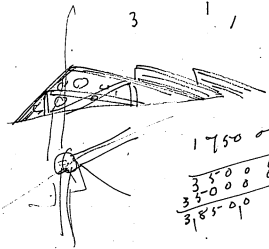
330000
60
19800.00
550
9900000000
990000000
10890000000

4 | 2200
5-50.
33000
.0



2200
12000000
44000000000
2200
2640000000000
1089.000000000
2.5311.000000

3 1 /



1750 000
2200
3500 00000
3500 00000
3850.00 00000

25.
8
200.

5.

5

25.

1

125.

8
200

25.

1300 / 7273 / 5.5

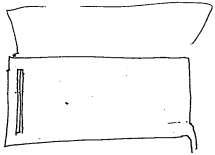
6500

7730

7500

6500

12300



Aug 22. 1882

Test for conductivity of various elements in Glass tubes 5/32 bore 4 3/4 inch long

Pure lamp Black 1210. Ohms
Common ——— 12000
Wallace Carbon burnt and powdered 31.1/3 Ohms
Wallace Com 155. Ohms
Peroxyde of Lead 16000. Ohms
Animal Black 15000. ——

John F Ott
Wm. Tice

Aug. 24. 1882.

Mixed pure lamp black and coal tar, to thick paste, then carbonized, in Plumbago Mold.

Resistance 1.3/10

Diam 95/1000

Length 3.1/8 inch

Carbonized base fibers

Resistance 4.5

Length 3. inch

Diam 80/1000

John. F. Ott,

Marlan U. Pope

Aug. 25. 1882

Tested Wheel Meter

	Time	stood at	24 Deg
Started	11.45		
	2.00	40	
	3.15	86	
	4.45	2	
	6.10	12 1/2	

This was with one cell Cooled in ice

John. F. Ott

Marlan U. Pope

Aug 26. 1882.

Mixed Dust from stove pipe with coal tar

Resistance 2.28

Length 3 inch

Diam $\frac{103}{1000}$

~~Carbonized cotton in spool shape~~

~~Resistance~~

In Cop on spool from C.T.Co

Resistance

Manilla Fiber fine

Resist

Coral

Resist

TM

Aug 29. 1882

M. N. E.

Started wheel Meter with one cell Calod battery and 50 ohms resistance out side of Meter in circuit

Time	Deflection
4.15 P M	13
6.6 " "	3½
9.30 } 2.0 A M	18
9.34 "	18

Aug 30, 1882

Restarted 1.40 with 33.3 ohms resist in circuit

Time	Deflect
1.40 P M	20
3.45 " "	21

Aug 31 1882

Record of wheat conditioned with 33.5 ohms heat in circuit.

Time	Def.	
8 AM	33	
9.45	34½ (B)	
Balls Started 6.5 Aug 31, 1882 with 20 ohms		
Time	Def.	
6.5	45	

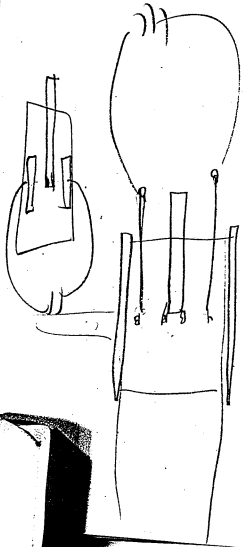
John E. Cook
W. W. J.

Aug 31. 1882

Tested regulators with 12 sounders in Mult circ 100. ohms in field each sounder short circuiting a portion of the resistance, the result was as follows

Left	Right	
155 —	84.1	When was cutting lamps out
197 —	106.9	
190 —	103.1	
195 —	105.8	
187 —	101.5	
183 —	99.3	
177 —	96.1	
176 —	95.5	
170 —	92.3	
177 —	96.1	
163 —	88.4	
160 —	86.8	
158 —	85.7	

Left	Right	
158	85.7	When was plugging lamps in
155	89.5	
167	90.7	
168	91.2	
170	92.3	
175	95.0	
180	97.7	
185	104.	
190	103.1	
195	105.8	
197	106.9	
205	111.2	
210	113.9	



J. T. Bottomley May 3 1885

Experiments to discover a new form of Energy using the Mutograph Mirror as indicator

following Electrodes to be used each pair immersed in each of the solutions

Electrodes.

Sulphur —	Zinc
"	Lead
"	Copper
Copper	Zinc
"	Carbon
"	Iron
"	Tin
Lead	Carbon
Lead	Zinc
"	Antimony
"	Bismuth
Antimony	Bismuth
Iron	Carbon
Tin	Iron
Zinc	Carbon

Mrs yB 1885

New form Energy Exports ~~Cabinet~~

J. 17.08

Liquids -

✓ Carbon Di Sulphide
✓ Turpentine
✓ Alcohol
✓ " & Chloral Hydrate
Wood Naptha
✓ Benzine
✓ Benzol
Nitro Benzol
✓ Kerosene
✓ Boiled Linseed
✓ Oil Anise
✓ Glacial Acetic acid
✓ Alcohol & Salicylic acid
Ether
Chloroform
✓ Formic acid
Hummus
Sulphurous anhydride
✓ Glycerine fumé
Sugar strong sol in alcohol
Carbolic acid
✓ Creosote
Fusel oil.

Continued p. 153

52
40 | 208
5

2080.

9400 | 4
37 | 600

9400.
15
47000
94 00
300 | 141 00 0
1200
2100
2100

470
300
141,000

300 | 9400 | 31. 470.
900
400

Information

Long Commercial Cable.

Knots 2345.
Resistance 6967
Capacity Infrared 876

Short Cable.
Insulation
33916 megohm per mile.

Short Long Island Cable

Knots 826
Resistance 13264
Capacity Microfarads 231.

On Cable 50 mf of Capacity interpolated at each end stop Earth Current through which they signal

May 3 1885 T.C.E.

Newton Energy Experiments
Continued

Lead peroxidized & Lead in Solution of Linseed oil — also Solution Sulphur in alcohol — also protoxide iron sulphate in alcohol — also same in glycerine —

Tin & hard Rubber Electrodes in Carbon Disulphide — also same Carbon substituted for tin —

Storage Batteries — Lead & Lead

Experiments continued from Vol. 50, p. 27.

Solution 4 - Manganese Sulph. & Zinc Sulph.

Battery alone on Stop	Cell alone on Cell	Time 11th May 85	Deflection
46 on left 51 " right	no deflection	2h 01' Pm.	50 on stop left
		03 "	36 " "
		05 "	20 " "
		08 "	15 " "
		11 "	16 " "
		one 5 secs	2000 Cell
		10	200 discharge
		20	150
		30	85
		40	71
		50	59
		1m	50
		10	43
		20	36
		30	32
		40	30
		50	27
		2m	24
		10	22
		20	20
		30	18
		40	17
		50	16
		3m	15
		30	14
		4m	12
		30	11
		5m	10
		30	9
		6m	8

Remarks

Repetition of a previous exp. see page 472, Vol. 50.

Solution fresh & more saturated with the manganese sulphate than the first one.

Very little gas liberated.

Deflection plate has a white coating } at 2.0 pm.
Positive " " " dark " or stain }

Stops appear to be the same as the discharge.

During second charge spongy zinc collects at lower ends of plates

10 min	37
30 secs	37
11 min	37
12	37
13 min (2nd)	37
14 min	37
15 min	36
16 (2nd)	35
17	34
18 min	33
19 min	33
20 (2nd)	32
22	32

2h 18	20 on steep
19	15 " "
21	17 " "
23	16 " "
29	14 " "
5 secs	at right angles
10	" " "
20	" " "
30	" " "
40	" " "
50	" " "
1 min	150
10	120
20	80
30	70
40	64
50	60
2 min	55
10	53
20	50
30	48
3 min	44
30	42
4 min	39
30	37
5 min	37
30	37 U
6 min	37
30	38
7 min	39
30	40
8 min	39
30	38
9 min	38
30	37

15 left 2° deck light
17 right

Was opening fine
would this time

3h 05	11 on steep
30	10 " "
06	9 " "
07	8 " "
08	8 " "
13	7 " "
18	7 " "
2 secs	off deck
10	
20	150
30	140
40	135
50	130
1 min	130
10	80
20	60
30	51
40	45
50	38
2 min	30
10	27
30	26
3 min	21
30	18
4 min	16
30	14
5 min	14
30	13
6 min	13
30	13
7 min	12
8	11
9	11

Prime solution – 4th Charge

	1° defl. left
12m	39
30"	40
13m	41
30	42
14m	43
30	44
15m (3:55)	45
30	46
16m	46
17m	47
18m	48
30	49
19m	50
20m (Lost)	50
21m	49
22m	49
23m	48
24m	48
25min	48
27m	48
28m	48
29m	48
30m	48
32min	48

8h 30'	15 left –
32	8 "
40	7 "
secs	off scale
30	150
40	145
50	140
1 min	140
10	138
20	134
30	130
40	160
50	70
2m	60
10	54
20	49
30	45
40	41
50	38
3m	37
10	35
20	34
30	33
4m	30
30	29
5m	29
30	29
6m	28
30	28
7m	29
8m	31
9m	33
10 – (3:50)	35
11	37
30	38

5th charge

	1° defl. left
12'	28
13	28
14	27
15 – (4:50)	27
17	27
18	26
20	25
21	24
22	24
24	23
25 (5:40)	27
26	31
30	33
27	36
30	39
28	41
30	42
29	42
30	42
30	42
31	42
30	40
32	41
33	42
34	42
36	42
39	42
45	39
49	37

4h 25'	12 on th.
35	11 " "
28	10 " "
29	8 "
35	7 " "
1 secs	off scale
40	150
50	145
1min	140
10	140
20	137
30	135
40	135
50	135
2m	130
10	120
30	80
40	60
50	53
3m	47
10	43
20	41
30	38
4m	32
30	31
5m	30
30	30
6m	29
30	28
7m	28
30	25
8m	28
9m	25
10m	28
11m	28

Lin + Lin — 12th May. am

Charge of plates in Solution 89.

Betting	Cell Nothing	Time	Reflection
		9h 35'	5 on strip
		36'	4½
		38	4½
		46'	4½
		10 secs	150 on coil
		20	130
		30	115
		40	115
		50	115
		1m	115
		30	115
		2m	115
		30	110
		3m	95
		10	80
		20	60
		30	50
		40	47
		50	43
		4m	40
		10	37
		20	34
		30	32
		40	30
		50	27
		5m	26
		10	24
		20	22
		30	21
		50	20
		6m	19
6m 30 sec	18		
7m	17		
30	15		
8m	14		
30	13		
9m	13		
30	12		
10	11		
30	11		
11	10		
30	10		
12	10		
30	9		
13	9		
14	9		
15	8		
16	8		
17	8		
18	8		
19	8		
20	7		
21	7		
22	6		
23	6		
24	6		
25 (10:10)	6		

Very little spongy time formed on plates.

26	6
27	6
28	5
29	5
30 (10:40)	5
32	5
34	4
36	4
37	4
38	4
40	4

Yth chase - 20 minutes.

Pot	Cell	Time	Refl.
	Nothing	12: 13	6 on Strip
		14	5 " "
		23	4
		33	4 " "
		10 secs	150 on Cap
10 mins	16	20 "	140
11 mins	15	30 "	135
12	14	40 "	130
13	14	50 "	130
14	13	1m	120
15	13	20	120
16	12	2m	120
18	11	30	120
20	10	3m	115
22	9	30	100
		L 40	80
		50	50
		4 mins	50
		10 secs	40
		20	28
		30	26
		40	24
		50	22
		5m	20
		30	16
		6m	23
		30	21
		7m	20
		30	19
		8m	18
		30	17
		9m	16
		30	16

Comparison of cells of $ZnSO_4 + MnSO_4$ with Zinc & Zinc

Solution B — 10,3 mns $ZnSO_4$ + 10,1 — $MnSO_4$ + H_2O — H_2O

Time	Defl.	Time	Deflection
2h 01' 00"	5 charge	2h 14' 00"	5 charge
02' 00"	5	15' 00"	5
03' 00"	5	16' 00"	5
04' 00"	5	18' 00"	5
05' 00"	4½	19' 00"	5
06' 00"	4½		
06 00	150 discharge	19' 50"	110 discharge
10	140	10"	75
20	37	20"	72
30	26	30"	65
40	20	40"	45
50	17	50"	35
(1) 07' 00	15	(1) 20' 00	27
10	14	10"	23
20	13	20"	20
30	12	30"	18
40	11	40"	16
50	11	50"	15
(2) 08' 00	10	(2) 21' 00	14
30	9	10	13
(3) 09' 00	8	20	13
30	7	30	12
10' 00	7	40	11
30	6	(3) 22' 00	8
(5) 11' 00	5	30	7
30	4	(4) 23' 00	6
(6) 12' 00	4	30	5
		(5) 24' 00	4
		30	4
		(6) 25' 00	3
		30	3
		(7) 26' 00	2

Discharged sufficiently before next charging.

3rd charge

2h 32' 00	5 charge
33' 00	5
42' 00	4½
42' 50	150 discharge
10"	120
20"	110
30"	95
40"	85
50"	85
(1) 43' 00"	81
10"	75
20"	60
30"	50
40"	43
50"	37
(2) 44' 00	32
10	28
20"	23
30"	20
40"	18
50"	17
(3) 45' 00	16
30	15
(4) 46'	13
(5) 47' 30	10
30	6
(6) 48'	5
30	4
(7) 49'	4
30	3
(8) 50'	3

Solution "O" - 15 grms $Zn SO_4$ + 15 grms $Mn SO_4$ + 1 ccm grm H_2O

Time	Deflection	Time	Deflection
8^h 57' 00"	5 charge	8^h 06' 00"	5 charge
58' 00"	5 "	07' 00"	5 "
59' 00"	5 "	11' 00"	5 "
59' 50"	150 discharge	11' 8"	160 discharge
00	80 "	10	140 "
20	35	20	65
30	19	30	36
40	13	40	26
50	10 "	50	18
9^h 00	8	(1) 12' 00	16
10	7	10	13
20	6	20	11
30	5	30	10
40	4	40	9
50	4	50	8
1' 00	3	(2) 13' 00	7
10	3	10	6
30	3	20	5
2' 00	3	30	4
30	2	(3) 14' 00	3
(4) 3'	2	30	3
30	2	(4) 15'	2
(5) 4'	1	30	2
		(5) 16	2

Time	Deflection
8^h 19' 00"	5 charge
20' 00	5 "
29 00	5 "
29	
30	150 discharge
20	120
30	82
40	56
50	41
(1) 30 00	33
10	27
20	22
30	19
40	17
50	16
(2) 31' 00	15
10	14
20	13
30	12
40	11
50	10
(3) 32' 00	9
10	8
(4) 33' 30	7
(5) 34' 30	5
(6) 35' 30	3
(7) 36' 30	2
36	2

Solution "D" [illegible]

3^d ... 52' -- 00 -- 5 charge
53 -- 00 -- 5 "
57 -- 00 -- 5 "

57 -- 7 -- 100 discharge
10' -- 20
20 -- 20
30 -- 52
40 -- 15
50 -- 13
58 -- 00 -- 10
10 -- 8
20 -- 7
30 -- 6
40 -- 6
50 -- 5
59 -- 00 -- 5
10 -- 5
20 -- 4
30 -- 4
4^h -- 00 -- 00 -- 4
30 -- 3
01 -- 00 -- 3
30 -- 2
02 -- 00 -- 2

4^h 00' 20 -- 5 charge
05 -- 5 "
09 -- 5 "

09 -- discharge
10 -- 150
20 -- 110
30 -- 75
40 -- 48
50 -- 32
10 -- 00 -- 23
10 -- 20
20 -- 17
30 -- 14
40 -- 13
50 -- 12
11 -- 00 -- 10
10 -- 9
20 -- 8
30 -- 7
40 -- 5
50 -- 5
12 -- 00 -- 4
10 -- 4
30 -- 3
13 -- 2
30 -- 2
14 -- 1

3^d 14 00 -- 5 charge
15' 00 -- 5 "
27 00 -- 5 "

27 -- 00 -- discharge
10 --
20 -- 150
30 -- 120
40 -- 90
50 -- 72
28 -- 00 -- 75
10 -- 60
20 -- 47
30 -- 35
40 -- 30
50 -- 27
29 -- 00 -- 24
10 -- 19
20 -- 17
30 -- 16
40 -- 15
50 -- 14
30' -- 00 -- 13
10 -- 12
20 -- 10
30 -- 9
31 -- 00 -- 8
30 -- 6
32' -- 00 -- 5
30 -- 4
33 -- 4
30 -- 3
34 -- 3

5h 01' 00 --- 5 charge
07' 00 --- 5 "
06 00 --- 11/2 "
06' 5 --- 100 discharge
10 --- 60
20 --- 25
30 --- 14 "
40 --- 10
50' --- 8
(1) 07' --- 00 --- 6 "
10 --- 5
20 --- 4
30 --- 4
40 --- 3
50 --- 3
(2) 08' --- 00 --- 3
30 --- 3
3) 09 --- 00 --- 3
30 --- 2
(4) 10 --- 00 --- 2

5h 11' --- 00 --- 5 charge
12 --- 00 --- 5 "
14 --- 00 --- 5 "
16 5 --- 100 discharge
10 --- 70
20 --- 37 "
30 --- 26
40 --- 22 "
50 --- 16
(1) 17' --- 00 --- 12
10 --- 10
20 --- 9
30 --- 9
40 --- 8
50 --- 8
(2) 18' 00 --- 8
10 --- 7
20 --- 7
30 --- 7
(3) 19' --- 00 --- 6
30 --- 6
4) 20' --- --- 5
30 --- 5
5) 21 --- --- 5

5h 22' --- 00 --- 5 charge
23 --- 00 --- 5 "
32 --- 00 --- 11/2 "
32 05 --- 100 discharge
10 --- 95
20 --- 57
30 --- 41
40 --- 39
50 --- 36
33' --- 00 --- 35
10 --- 33
20 --- 29
30 --- 25
40 --- 22
50 --- 18
(2) 34' --- 00 --- 16
10 --- 15
20 --- 14
30 14
(3) 35' --- --- 13
30 --- 12
(4) 36 --- --- 11
30 --- 11
(5) 37 --- --- 10
30 --- 10
(6) 38 --- --- 10
30 --- 9
(7) 39 --- --- 9

13th May 1880. Ann. Sin & Ji.

Time	Refl.
9h 17' 00	5½ charge
18 00	5 "
26 00	5 "
32 3 00	150 discharge
10	73
20	33
30	25
40	16
50	13
(1) 33 00	11
10	10
20	9
30	9
40	8
50	7
(2) 34 00	8
10	7
30	7
3 35 00	6
36	6
4 36	5
30	4
5 37	4

Time	Refl.
9h 38' 00	5 charge
3 in 00	4½ "
38 00	4½ "
39' 00	150 discharge
10	110
20	65
30	46
40	34
50	26
(1) 39 00	22
10	18
20	16
30	14
40	13
50	12
(2) 40 00	12
10	11
20	10
30	9
(3) 41 00	8
30	7
(4) 42 00	6
30	5
(5) 43 00	5

3rd charge

9h 49' 00	4½ ch.
50 00	4½
59 00	4½
59' 7	150 disch.
10	130
20	110
30	78
40	69
50	58
10h 00	52
10	43
20	37
30	33
40	30
50	27
(2) 01 00	25
20	22
30	20
(3) 02 00	18
30	16
(4) 03 00	14
30	12
(5) 04 00	11
30	11
(6) 05 00	10
30	10
(7) 06	9

Copper (+) & Zinc (−)

11h 22' 00"		4 charge
33	00	3/2 "
27	00	3/2 "
27		discharge
	10	120
	20	56
	30	33
	40	23
	50	18
(1) 28'	00	15
	15	13
	30	11
	45	10
(2) 29'	00	9
	15	9
	30	8
	45	8
(3) 30	00	8
	15	8
	30	7
(4) 31		7
	30	7

11h 32	00	4 charge
34	00	4 "
38	00	4 "
38	5	4 discharge
	10	120
	20	40 "
	30	28 "
	40	20
	50	15 "
(1) 39	00	14
	15	13
	30	12
	45	11 "
(2) 40	00	10
	15	9
	30	9
(3) 41	00	8
	30	8
(4) 42	00	7
	30	6
(5) 43	00	6
	30	5
(6) 44	00	5

5th charge		
11h 46'	00"	5 charge
47	00	4 "
56	00	3/2 "
56		discharge
	10	180
	20	100
	30	54
	40	45
	50	32
(1) 57'	00	25
	15	20
	30	17
	45	15
(2) 58'	00	14
	15	13
	30	12
	45	12
(3) 59'	00	11
	15	11
	30	10
	45	10
(4) 00	00	9
	15	9
	30	9
(5) 01	00	9
	30	8
(6) 02'	00	8
	30	8
(7) 03'	00	8

very little gas given

Beating on Zn, pure-black

" " Cu - white

178 #9 - "B" -

Tin (+) & Copper (-)

12h 16' 00"	4 charge	
07. 00	3½ "	
11. 00	3½ "	
11 -- 5 --	130 disch.	
10 --	80 "	
20 --	50 "	
30 --	33	
40 --	32	
50 --	27	
(1) 12 -- 00 --	23	
15 --	20	
30 --	18	
45 --	16	
(2) 13 -- 00 --	15	
15 --	14	
30 --	13	
45 --	12	
(3) 14 -- 00 --	11	
30 --	9	
14 15 -- 00 --	8	
30 --	7	
15' -- 00 --	7	

12 - 15 - 00 --	4 charge	
19 - 00 --	3½ "	
23 - 00 --	3½ "	
23. 7 --	150 discharge	
10 --	140.	
20 --	105	
30 --	86	
40 --	60	
50 --	49	
24' 00 --	40	
15 --	33	
30 --	27	
25' 45 --	22	
00 --	18.	
15 --	16	
30 --	15	
45 --	14	
(3) 26' 00 --	13	
15 --	12	
30 --	11	
(4) 27 - 00 --	10	
30 --	10	
(5) 28 - 00 --	9	
30 --	8	
(6) 29 - 00 --	8	

3rd charge

179

12h 30" 00"	3½ charge	
34 - 00 --	3½ "	
40 - 00 --	3½ "	
40 - 00 --	150 discharge	
10 --	140	
20 --	130	
30 --	110	
40 --	100	
50 --	85	
(1) 41 -- 00 --	73	
15 --	64	
30 --	51	
45 --	41	
(2) 42 -- 00 --	36	
15 --	30	
30 --	26	
45 --	25	
(3) 43 -- 00 --	21	
15 --	20	
30 --	19	
(4) 44 -- -- --	18	
30 --	17	
(5) 45 -- 00 --	16	
30 --	15	
(6) 46 -- 00 --	14	
30 --	13	
(7) 47 -- 00 --	13	
30 --	12	
(8) 48 -- 00 --	12	

Plates fresh in both cases & Same solution. No spongy zinc formed

Evidently Tin (+) and copper (-) is better than Tin (-) & copper (+) and better than Zn & "B" Tin + Tin

Zn amalgamated (−) & Zn (+)

#9 A"

1h	5-2'	00"	4	charge	2h 5'	00"	3½ charge
	5-3'	00	4	"	9	00	3½ "
3h	02'	00	4	"	15	00	3 "
	02	5	60	discharge	15'	5	186 discharge
		10	89			10	105
		20	76			20	62
		30	92			30	62
		40	19			40	65
(1.)	03	50	17			50	62
		00	15		(1.)	19' 00	55
		15	14			15	40
		30	13			30	35
		45	13			45	31
(2.)	04	00	12		(2.)	20' 00	26
		15	12			15	22
		30	11			30	20
		45	11			45	19
(3.)	05'	00	10		(3.)	21 00	18
		30	10			15	17
(4.)	06	00	10			30	16
					(4.)	22' 45	15
						00	14
						15	13
						30	12
						45	12
					(5.)	23 00	11
					(6.)	30	11
						24' 00	10
						30	10
					(7.)	25 00	10

Compare with p.173

Not so good as copper & zinc

Seems to retain its charge longer, though less rate so that deflections.

This charge (2nd) corresponds to 3rd of previous experiments.

Zn (+) & Zn amalgamated (−)

#9 A"

2h	5-1'	00"	4	charge	3h 06	00	4½ charge
	5-2	00	4	"	07	00	4½ "
3h	01	00	4	"	16	00	4½ "
	01'	5	100	discharge	16'	5	120 discharge
		10	53	"		10	95
		20	34			20	57
		30	21			30	40
		40	16			40	32
		50	14			50	27
(1.)	02	00	12		(1.)	17' 00	24
		15	11			15	21
		30	10			30	20
		45	9			45	18
(2.)	03'	00	9		(2.)	18' 00	17
		15	8			15	16
		30	8			30	16
		45	8			45	15
(3.)	04'	00	7		(3.)	19' 00	14
		30	7			15	14
(4.)	05'	00	7			30	14
						45	13
					(4.)	20 00	13
						30	13
					(5.)	21 00	12
					(6.)	22 00	12
						30	12
					(7.)	23 00	11

Not so good as previous combination

Copper & Copper.

Solution — Mercuric sulph. 10 grms, ZnSO4, 10 grms & H2O 100 grms

3h 39-00	5'	charge	
39-00	5	"	
45-00	5	"	
45-00	2	discks.	Us appreciable deflection after charging for 12 minutes
10			
20			
30			
40			
49-00			
15			
30			
45			
50-00			
15			
30			
45			
51-00			

Zinc plates

Solution — chloride of Zinc & potassium chloride of Zinc

4h 44'	5/2	charge	
45'	5	"	
54'	5	"	
54-05	11	discks	Us good
10	9		
20	7		
30	5		
40	4		
50	3		
55	2		

Solution — acetates of Mang. & Ceric — dark plates

5h 05'-00	5	charge	
06-00	5	"	
15'-00	5	"	
15-5	1	discharge	Us good
20	1		
30			
40			

Nitric Acid — Zinc

#4 — Nitro-prusside of Soda — Zinc & Lead

Time	Defl.	
9h 15' 00" -- 4 charge		Brown deposit of iron impurities, slide.
25' -- 00 -- 3½ "		
25' -- 3 -- 6 discharge		
10 -- 3		
20 -- 2		
30 -- 1		

#4 — Copper & Copper.

9h 33' -- 00 -- 2½ charge		Positive "Blackness"
43' -- 00 -- 2½ "		
43' -- 05 -- 15 discch.		
10 -- 12		
20 -- 7		
30 -- 5		
40 -- 4		

#5 — Nitro-prussiate of Soda & Phos. Ac. Sol. Zinc & Iron

9h 51' -- 00 -- 2½ charge		Very little deposit.
52 -- 20 -- 1½ "		
10h 01' -- 20 -- 1 "		
01' -- 4 -- 45 discharge		
10 -- 17		
20 -- 8 "		
30 -- 6		
40 -- 5		
50 -- 4		
02' -- -- 4		
10 -- 4		

#5 — Copper & Copper

10h 05' -- 00 -- 1° charge.		
15 -- 00 -- 2 "		Green deposit on copper
15 -- 5 -- 11		
10 -- 6		
20 -- 4		
30 -- 3		

Same as last but with more current in charging

10h 20' -- 00 -- 5° charge		Green deposit as before
30' -- 00 -- 9 "		
30 -- 5 -- 9 discharge		Less active than previous one.
10 -- 7		
20 -- 4		
30 -- 3		
40 -- 2		

Arsenious acid with copper & copper

10h 41' 00" -- 43 charge		
51' 20 -- 26 "		
58 -- 10		
10 -- 5		
20 -- 2		
30 -- 1½		
40 -- 1		

#21 - acetic acid + Phos. Ac. 5C,

Bottling	Call	Time	Refl.
54 left on 59 right stop	Not primary	Lin & Lin 11h 15 - 00 - - 15	-5 change on stop
Neptune flake gives off H.		15 - - 5 - - 10 - - 30 - - 35 - - 40 - - 50 - - 19 - 00 - - 30 - - 70 - 00 - - 71 - 00 - - 30 - - 40 - - 50 - - 22 - 00 - - 10 - -	8 discharge on coil 3 9 11 10 11 11 11 11 10 9 8 7 3 3

#33 - arsenious acid

	Not primary	Lin & Lin 11h 26 - 00 - - 36 - 00 - - 36 - 5 - - 10 - - 20 - - 30 - -	14 - change 1 2 1 1 1

#34 - Sulphide of Lime & Sulphide of Lime

7c right 6c left	2c left	12 noon - - 21 left 01 - 00 - - 18 10 - 00 - - 12 15 - 5 - - 46 10 - - 40 20 - - 50 30 - - 26 40 - - 70 50 - - 57 18 - 00 - - 46 10 - - 24 30 - - 36 (2) 17 00 - - 37 30 - - 36 (3) 18 - 00 - - 42 30 - - 43 (4) 19 - 00 - - 46 30 - - 46 (5) 20 - 00 - - 45 30 - - 44 (6) 21 - 00 - - 43 (7) 22 - 00 - - 42 (8) 23 - 00 - - 41 30 - - 40 (9) 24 - 00 - - 39 (10) 25 - 00 - - 37 (11) 27 - 00 - - 34 (12) 30 - 00 - - 40 28 40 - 00 - - 30	Spongy inner primary

"B"

Zinc(+) Copper(-)

with no half gone

12h 50-00"	5	charge
1h 00-00"	5	"
00-5	150	discharge
10	95	"
20	62	
30	43	
40	35	
50	31	
(1) 01-00	27	
15	23	
30	21	
45	20	
02-00	19	
15	18	
30	17	
45	16	
(2) 03-00	16	
30	15	
04-00	14	
30	14	
05-00	14	
06-00	14	
07-00	14	
08-00	14	
09-00	14	
10-00	14	
11-00	14	

1h 12-00	5	charge
24-00	5	"
24-4	150	discharge
12	120	
20	86	
30	70	
40	59	
50	50	
25-00	46	
15	37	
30	31	
45	26	
(1) 26-00	22	
15	20	
30	17	
45	16	
(3) 27-00	15	
15	15	
30	14	
45	14	
(4) 28-00	13	
30	13	
(5) 29-00	12	
30	11	
(6) 30-00	10	
30	10	
(7) 31-00	10	

"B"

Zinc(+) Copper(-)

1h 32-00	5	charge
44-00	5	"
44-70	150	discharge
10	120	
20	70	
30	51	
40	35	
50	28	
(1) 45-00	25	
15	23	
30	21	
45	20	
46-00	19	
15	18	
30	17	
45	16	
(3) 47-00	16	
30	15	
(4) 48-00	14	
30	14	
(5) 49-00	13	
30	12	
(6) 50-00	11	
30	11	
(7) 51-00	11	
30	11	
(8) 52-00	10	
30	10	
(9) 53-00	10	

1h 55-00	5	charge
2h 15-00	5	"
00-5	150	discharge
10	120	
20	112	
30	100	
40	70	
50	61	
(1) 06-00	52	
15	44	
30	36	
45	29	
(2) 07-00	24	
15	20	
30	19	
45	18	
(3) 08-00	17	
15	16	
30	15	
45	14	
(4) 09-00	13	
30	13	
(5) 10-00	12	
30	12	
(6) 11-00	11	
30	11	
(7) 12-00	10	

#9 "B" - 3rd charge of slots of tin(+) gauze(0) copper(-)

2h 16' -- 00 -- 5 charge
16 -- 00 -- 5 "
16' -- 00 -- 150 discharge
10 -- 126 "
20 -- 95
30 -- 90
40 -- 85
50 -- 80
(1) 27' -- 00 -- 77
15 -- 57
30 -- 43
45 -- 32
(2) 28' -- 00 -- 27
15 -- 23
30 -- 20
45 -- 18
(3) 29' -- 00 -- 17
15 -- 16
30 -- 15
45 -- 14
4 30 -- 00 -- 13
30 -- 12
5 31 -- 00 -- 11
30 -- 10
6 32 -- 00 -- 10
30 -- 9
7 33 -- 00 -- 9

#9 "B" 3rd charge of tin(+) & copper(-)

2h -- 35' -- 00 -- 5
45 -- 00 -- 5
45' -- discharge
15 -- 150
20 -- 130
30 -- 100
40 -- 95
50 -- 90
46 -- 00 -- 85
15 -- 70
30 -- 51
45 -- 43
47' -- 00 -- 38
15 -- 33
30 -- 30
45 -- 27
(3) 48 -- 00 -- 25
15 -- 23
30 -- 21
45 -- 20
(4) 49 -- 00 -- 19
30 -- 17
5 50 -- 00 -- 16
(6) 80 -- 15
(7) 51 -- 00 -- 15
30 14
(7) 52 -- 00 14

No advantage using a gauze substitute

192

3h 34-"B" – 10 grains Sulphate + 10 grains + 50 gr + 100 grains Sulph

3h 16. P.M. .. 5 charge
21 .. 20 .. 5 "

31 ..... discharge
10 .. 75 "
20 .. 37
30 .. 28
40 .. 22
50 .. 18
(1) 32 .. 00 .. 17
15 .. 15
30 .. 13
45 .. 11
(2) 33 .. 00 .. 10
15 .. 9
30 .. 8
45 .. 8
(3) 34 .. 00 .. 7
15 .. 7
30 .. 6
45 .. 6
(4) 35 .. 00 .. 5

3h 29. 00 .. 5 charge
34 .. 00 .. 5 "

34 .. 5 .. 150 discharge
10 .. 120
20 .. 77
30 .. 70
40 .. 50
50 .. 34
(1) 35 .. 00 .. 30
15 .. 22
30 .. 17
45 .. 14
(2) 36 .. 00 .. 12
15 .. 11
30 .. 10
45 .. 9
(3) 37 .. 00 .. 8
15 .. 8
30 .. 7
45 .. 6
(4) 37 .. 00 .. 6
30 .. 5
(5) 38 .. 00 .. 4

3rd charge

193

3h 43 .. 00 .. 5 charge
53 .. 00 .. 5 "

53 .. 6 .. 140 discharge
10 .. 120
20 .. 95
30 .. 78
40 .. 70
50 .. 73
(1) 54 .. 00 .. 70
15 .. 51
30 .. 31
45 .. 24
(2) 55 .. 00 .. 21
15 .. 19
30 .. 17
45 .. 16
(3) 56 .. 00 .. 15
15 .. 15
30 .. 14
45 .. 13
(4) 57 .. 00 .. 13
30 .. 12
(5) 58 .. 00 .. 11
30 .. 11
(6) 59 .. 00 .. 10
30 .. 10
(7) 00 .. 00 .. 9

Compare with 28.1.14 – 5
4 " " " 166 – 7
about equal to or a little less than the + the in gram. sulphate and magnesium "

see exp. 187
– very likely time was about 1 hour

Lecture suggests as the (a) coefficient is in gram + magnesium sulphate

Sn & Sn

194 Potencialphase of Sn & Sulphate of Manganese

4h	35' 00"	-5 chgs
	45' 00"	-5 "
	15 - 5	-6 discharge
	20	4
	10	3
	30	3
	40	3
	50	2
	60	2

Potencialph of Sn at first so much but came down during charging.

Very similar discharge as was given by Sn in MnSO4 p. 270 Vol. 50.

#95 Acetic Acid —

Sn & Sn

Battery	Cell	Time	Diff.
56 left	Not priming	5h 55' 00"	1 on chgs
62 right		05' 00"	3 " "
		05' 00"	-3 on coil
		10	-3
		20	-2
		30	-2
		40	-2
		50	-2

gas evolved from depolarizing plate.

Depolarizing plate decreased

Sn & Sn

#97 — Acetate of Ammon. & Chrom. Ac. Sl. 195

Battery	Cell	Time	Diff.
54 left on chgs	Not priming	5h 12' 00"	10 on chgs
61 right " "		30"	4 " "
		22 00	1 " "
gas given off freely		32 05	-5
Cuticular plate		10	-5
		20	-4
Stained a brown color		30	-4

15th May 1885 — Acc.

Solution #26 - Sulphuretted Amm & Lime - Lin & Lin

Setting	Acc
59 left	1° right
66 right	

Neptune pulse blackness & pieces off gas freely.

Lime ...

9h	23'.00	29 Strong Stage
	24'.00	27 " "
	28'.00	22 " "
	35'.00	coil-stick
	15	50
	25	40
	35	34
	40	28
	50	22
(1)	54'.00	20
	15	30
	30	20
	45	26
(2)	55'.00	23
	15	21
	30	19
	45	17
(3)	56'.00	15
	15	14
	30	13
	45	12
(4)	57'.00	12
	30	11
(5)	58'.00	11
	30	10
6	59'.00	10

#28 - Propylic acid

left - 48	Urine	9h	25'.00	3 Strong
right - 54	primary		40'.00	1
			50'.00	
Neptune pulse stained a little			55	3 - 2 Coil
			10	1
			20	1

#29 - Jennie acid

	Urine	10h	05'.00	4 Strong
			10	3
			15'.00	2
			15	2
			30	1
			40	1

#30 - Jennie Acid & Ac. Acid & Ac.

Gas burn blue.	ch	10h	37'.00	3 Strong
			38'.00	2
			47'.00	2
Both pulses stained a brownish yellow color.			47	30
			50	22
			55	14
			60	9
			70	7
			80	6
			47	6
			15	5
			30	5
			45	5

Sir H Sm

#31 - Glycerin & salt (nacl)

55 - left	Nothing	11h 05' - 00 -	1 sheep
66 right		15' - 00 -	1/2 "
Goes very lightly		15' - 3 -	3 sheep
from urethra pb.		10 -	2
		20 -	2
		30 -	1

#32 - Glycerine & Sucrose

3 on coil		11' - 18' - 00 -	35' on strip
		20 - 00 -	3 " "
Goes from urethra		30' - 00 -	2
1 left		37 - 0 -	15 sheep
		10 -	14
		20 -	10
		30 -	8
		40 -	7
		50 -	7
	60'	00 -	6
		15 -	6
		30 -	5
		40 -	5
		31 - 00 -	5
		15 -	4
		30 -	4
		45 -	4
		32 - 00 -	4

Sir H Sm

#33 - Glycerine & Phosph. ac. 86

54 left	Nothing	11h - 54' - 00 -	1 sheep
63 right		24' - 00 -	"
Urine copper.		44 - 0 -	10 - 0 - 6
Urine stain on		10 -	7
		20 -	6
		30 -	5
Irish potatoes		40 -	4
		50 -	3
immediately,		55 - 00 -	2
Goes from urethra - pb.			

#34 - Boric acid -

1 left		11h 54' - 00 -	17 on strip
		55' - 00 -	8 " "
		12h 05' - 00 -	6 " "
Goes freely from		05' - 05' -	21
off from urethra		10 -	17
Stole		20 -	12
With potatoes urine.		30 -	8
		40 -	5
Dickly blackened		50 -	3
	06'	00 -	2
Solution turnings green.		15 -	"
		30 -	1

Sun & Sh.

#35 – Cyclic ac. & Phosp. ac. Sh.

Nothing

Both plates fine
off gas fully.
Brownish stains.

12	15 Pure	5 sharp
	15	6 "
	25 – 40	4 "
	25 – 7	12 disch. on
	10	10 "
	20	7
	30	4
	40	2
	50	2

#36 – Tetanic acid

58 left
65 right

Nothing

12	45 Pure	10 Large not
	50	7 "
	55	0
	55 – 5	2 disch. on
	10	1
	20	1
	30	1
	40	

Gas given off
very freely from
radium plate
–

#37 – Tetanic acid & Ph. ac. Sh.

Nothing

Position of blackened
immediately.
– Gas given off freely
[illegible]

1	60 – 50	7 – sharp
	70	7 "
	80	7 "
	80 – 5	30
	10	15
	20	9
	30	7
	40	5
	50	4
	31 – 00	2

Sun & Sun

#38 – Alum

56 left
66 right

Nothing

1	50	50 Pure
	55	30 "
	60	15 "
	70	8 "
2	00	[illegible]
	02 – 3	32 disch.
		30
		21
		12
		8
		5
	03 – 30	5
	15	4

Gas given off
very rapidly.
Plates both blackened

#39 – Alum & Ph. ac.

Nothing

Plates stained
immediately.
– Gas liberated

2	[illegible]	7 sm. sharp
	20	7 "
	24 – 55	33
	10	26
	20	17
	30	13
	40	6
	50	7
35	00	6
	15	5
	30	5
	45	4
36	00	2

#43 – Alum & Thorium

50 light	Nothing	2h 29 a.m.	50 strong
54 light		30	20 "
		34	14 "
Gas bubbles freely		39	43 decided
Glass blackened		50	25
		55	14
		30	9
		40	7
		50	5
		40	3

#41 – Ammonium Chloride & Uranium Fluoride

		2h 44 a.m.	20 strong
Negative & gaseous deposit.		50	17 "
		55	6
		55	150 decided
2h 59 a.m.	50	10	150
15	48	20	135
30	46	30	120
3h 00	42	40	100
30	39	50	95
(6) 01	36	(1) 56	90
(7) 02	33	15	85
(8) 03	30	30	78
(9) 04	27	45	76
10 05	25	(2) 57	72
06	23	15	69
(11) 07	21	30	66
(12) 10	18	45	63
(13) 12	15	(3) 58	60
		15	58
		30	56
		45	53

#43 – Ammonium Chl. & Uranium

Nothing	3h 30 a.m.	49 ok.	
	35	27 "	
White cloud forms around plates.	45	18	
	45	[illegible]	
	50	15·0	
	30	9·3	
Spongy mass formed	40	7·2	
	50	6·3	
Grey deposits on plates.	46 50	5·0	
	55	4·7	
	5h	4·5	
	25	3·6	
	47 25	3·3	
	30	3·1	
	48 30	2·7	
	30	2·3	
	49 00	3·2	
	30	2·5	
		2·2	
	52 00	2·1	
	[illegible]	1·7	
	[illegible]	1·5	
	55 00	[illegible]	

#44 - Fulminal Claude -

Sex ♂

Not primary 4th 5th 00 - 23 stage.
Practice of blackmail 20 - 2
Thinks times of jes 30 - 9
when [illegible]
Hitts pt. pounds (trick) 35 - 7 13
10 - 10
20 - 7
30 - 6
40 - 6
50 - .5
60 - .5
15 - 4
30 - 3

#45 - Bernin ch. & Stanyan a.

Sex ♂

45 left 11° left on coil
49 right

Pain [illegible] 2 [illegible] 5th 00 - 23 ch.
10 - 25 "
45 00 - 22 "
53 30 - 18 "
55 55 - 110 check
10 - 95
20 - 70
30 - 62
40 - 26
50 - 12
(1) 54 - 00 - 8
15 - 6
30 - 4
45 - 2
(2) 55 - 00 - 2

Pain [illegible] 2 [illegible]
Practice blackmail

#46 - Sulphate & Dean

Sex ♂

39 left
42 right

Not primary 5th 01 - 10 ch.
35 - 9 "
11 - 2 "

Pain [illegible] 11 - 50 check
15 - 25 "
20 - 17 "
30 - 15 "
45 - 16
50 - 15
12 00 - 15
15 - 14
30 - 14
45 - 13
13 00 - 13
15 - 12
30 - 12
45 - 12
14 00 - 11
15 - 11
30 - 11
45 - 12
15 00 - 12

16th May, am.

50 - Carbonate of Potassium - Sir & Sm

Another	Cell	Time	Gal.
56 left	Not primary	2h 05' 00"	6 steady
57 right		14 00"	5 "
		15 00"	8
Little + sky		15' 00"	9 an will
immediately		10	6 drift
reflective film.		20	4
Probably Ba_2CO_3.		30	3
Gas fully from negative		40	2
		50	2
		16' 00"	1

51 - Bicarbonate of Potassium -

	Nothing	9h 33' 00"	6 steady
Gas visibly		43' 00"	0 "
each side		43 50	10 drops
		10	8
		20	5
		30	3
		40	2
		50	2
		44' 00"	1

56 - Sulphate of Potassium

	Nothing	9h 55' - 00"	21 steady
		56 - 00	20 "
Gas pair off		60h 05 - 00	7 "
lively		05 - 7	13
Cloudy ppt.		10	7
		20	5
		30	4
		40	3
		50	3
		66' - 00	2

53 - Bisulphate of Potass.

	Nothing	15h 16 - 00	29 steady
Gas pair off		17 - 00	27 "
fairly well		18 50	19 "
Nothing left.		19 - 00	12
Potassium left		[illegible]	4
Filmed each.		[illegible] - 3	18 drops
		10	15
		20	13
		30	12
		40	11
		50	11
	(1)	27 - 00	11
		15	10
		30	10
		45	10
		28 - 00	10
		15	10
		30	9
		45	9
		29 - 00	9

Sw & Sn

#54 - Bromide of Potassium.

50 left — Nothing
54 right

Clear, slightly pp
falls immediately
upon mixing.
Gas from reagents
Precipitate partially
Fe_2O_3, Cr_2O_3

10h	34' 00"	15	charge
	35' 00"	13	"
	36' 00"	5	"
	44' 00"	5	"
	46' 5"	18	decch
	10	10	
	20	5	"
	30	3	
	40	2	"
	50	2	"
55	00	2	"

#55 - Permanganate of Potassa.

2 hrs 15

very little chemical action.

10h	49' 00"	2	charge
	50 00"	1	"
	57' 00"	0	"
	59' 5"	18	decch
	10	17	
	20	7	
	30	5	
	40	4	
	50	4	
11h	00	00	4
		15	3
		30	3

Sw & Sn

#56 - Sulphocyanide of Potass.

50 left — Nothing
54 right

Pass green after
heating.

11h	03' 00"	13	charge
	04' 00"	11	"
	13' 00"	0	"
	13' 4"	12	decch
	10	7	
	20	5	"
	30	11	
	40	3	
	50	3	
14'	00	3	

#57 - Ferro-cyanide of Pot.

Nothing

very little
action after

12h	07' 00"	13	charge
	08' 00"	6	"
	12' 00"	0	"
	14' 5"	19	
	10	13	
	20	6	
	30	4	
	40	3	
	50	3	
24'		3	
	15	2	
	30	2	

Sin & Le

1/55 – Hypo-sulphite of Potass.

46 left
52 right

Nothing

11 54' am	28	charge
55 "	20	"
12 "	11	"
5 pm	4	"
4 "	0	"
44' 20		discharge
10	15	
20	11	
30	9	"
40	8	
50	7	
60	7	
15	6	
30	5	

Positive pole off & negative colored. p.

1/54 – Arsenate of Potass.

Not primary

11h 54' am	2	charge
55 "	1	"
12h "	0	"
04' 8	22	discharge
10	16	"
30	12	
50	9	"
40	6	
50	5	
01' 00	4	
15	3	
30	2	

Positive pole off.

Sin & Le

1/60 – Arsenate of Potass & Pot. Ac. Ed.

44 left
52 right

Not primary

12h 13' Pm	8	charge
14 00	1	
23 00	0	
23' 5	30	discharge
10	26	"
20	11	
30	7	
40	6	
50	5	
1h' 00	4	
15	4	
30	3	
45	3	
05' 00	2	

Positive pole off.

#9 "A" — 15th May am

For comparison Time readings with the 9 o'clock

Time	Deflections	Time	Deflections
9h 28' am	2 charge	9h 43' -- 00	4½ charge
31' -- 00	2 "	44 -- 00	2½ "
35' -- 00	2 "	45' -- 00	2 "
36' -- 50	50 discharge	-- 8	
10	42	5	64 discharge
20	34	10	57
30	32	20	47
40	31	30	39
50	28	40	29
(1) 26' -- 00	23	50	23
15	18	(1) 50' -- 00	20
30	16	15	17
45	13	30	14
(2) 27' -- 00	12	45	12
15	11	(2) 50' -- 00	11
30	10	15	10
45	10	30	10
(3) 28' 00	9	45	9
15	9	(3) 51' -- 00	9
30	8	15	8
45	8	30	8
(4) 29 00	7	45	8
15	7	4 52' -- 00	7
30	7	15	7
45	6	30	7
(5) 30' 00	6	45	7
		(5) 53' -- 00	6

9h 55' 00	3 charge
56' 00	2½ "
9h 06' 00	"
6 -- 5	70
10	54
20	47
30	36
40	29
1 05' 00	24
15	20
30	17
45	14
2 00' 00	12
15	11
30	11
45	11
3 00' 00	10
15	10
30	10
45	10
4 00' 00	9
15	9
30	9
45	9
5 00' 00	8
15	8
30	8
45	7
6 00	7

Does not compare well with the Tapper & Gine & manganese sulfate solutions.

Battery current is now is slightly weaker, due though to internal resist of cells

Cadmium + Cadmium

* 2 – Red Flash

Battery	Cell	Time	Eight
40 left side	not firing	10h 31'.00"	39 charge
34 right "		32'.00"	37 "
		33'.00"	34 "
		35'.00"	27 "
Plebs blackened		41'.00"	
		41'.45	15"
		50	16
		20	6
		30	3
		40	1
		50	0
		42'.00	2
		15"	3
		30	4
		45"	4
		50	3

* 4 – Nitro-prussian of Soda

	Nothing	10h 59'.00"	Zero [illegible]
		11h 00'.00	[illegible] "
Brown colouration		09'.00	1
negative [illegible]		10	6
		20	0
		30	0
		40	0

Nitro-prussic spirous + Pb. Ac. Sol.

	Nothing	11h 21'.00"	8"
		35'.00	1
		35"	7
		10	7
		20	6
		30	5"
		40	5"
		50	5"

* 6 –

40 left	8" right	11h 52'.00"	19
40 left		56'.00"	12
		12h 02'.00"	9
320 fresh from		02'.15	15"
negative in late,		10	8
		20	66
		30	66
		40	15
		50	12
		03'.00	13
		10"	12
		30	11
		45	11
		52'.00	10
		15"	10
		30	60

Col + Col

#6 - Manganese Chloride

39 left	Nothing	12h 19m 00s	21	charge
39 right		00 00	19	"
		39 00	18	"
		39 - 3	73	decrease
		10	42	
		20	28	
		30	20	
		40	12	
		50	10	
		30 00	9	
		15	8	
		30	7	
		45	6	
		31 00	5	
		15	3	
		30	2	

Position of Electrode
without of gives of
for accy.

*7 - Phosp. Acc.

	1° right	12h 45m 00s	2	charge
		55m 00s	0	
		55 - 6	27	
		10	19	
		20	7	
		30	6	
		40	5	
		50	4	
		56	3	

No calibration
See prism off
Eight

#9 Zinc Sulph + Magnesium Sulph.

	Nothing	1h 10m 00s	21	charge
		11 00	24	
		20 00	14	
		50 5	140	decrease
		0	135	
		20	120	
		30	55	
		40	29	
		50	15	
		55 - 00	12	
		15	8	
		30	7	
		45	6	
		22 00	5	

*10 - Phosph. Acc. Succ.

39 left	1° Right	1h 30m 00s	20	charge
39 Right		31 00	19	"
		56	16	"
		40	12	
		40 5	24	
		10	19	
		20	16	
		30	11	
		40	8	
		50	4	
		56	2	

Col + Ecl

#11 – Hydrocyanic acid of Merck, 7th acc. Sol.

1° left	1h	51'	av.	6 ok
Plates stained green.	3h	02	av.	2
		02	5	4 dis
			10	3
			20	3
			30	3
			40	3

#14 – Ferric cyanide

29 left 30 picked up	Nothing	3h	10'	av. 15 ok
			11'	av. 14
Gas given off			20	av. 11 dis
			30	5 3
				10 3
				20 3
				30 2
				40 2
				50 2

#15 – Boracic acid

	Nothing	2h	4h	00' 0 ok
Little gas given off			3h	av. 0
No calcination			3h	av. 2
				10 2
				20 2
				30 1
				40 1

Col + Ecl

#16 – Ammon carb + Glac. ac.

	Nothing	2h	20'	av. 3 ok
			52	av. 1
Plates + Gelatin		52	4	9 dis
			10	5
			20	2
			30	2
			40	1

#18 – Phosphorus [illegible]

	Nothing	3h	02'	av. 2 ok.
			12	av. 2
		12	5	10 dis
			10	3
			20	2
			30	1
			40	1
			50	

#19 – Acetic [illegible]

	Nothing	3h	20'	av. 17 ok
			21	av. 15
Gas burn			30	av. 9
No change			30	5 20 dis
				10 8
				20 4
				30 4
				40 3
				50 2
				60 2

#20 - Arctic acid, Cl reb

28 left nothing
30 inj. 05

3h	33' 00"	8 ch.
	34' 00"	7 "
	43' 00	7 "
	43' 4	24 disch.
	10	22
	20	22
	30	21
	40	21
	50	20
	44' 00	19
	15	14
	30	11
	45	10
	45' 00	8

very little change
[illegible]

Plates stained

#21 - Arctic acid, Cl. Ki. ac. E.G.

nothing

Plates blackened
as before.

3h	50' 00"	8 ch
4h	00. 00.	4
	5	1 disch
	10	16
	20	16
	30	15
	40	15
	50	15
	61' 00.	15
	5	15
	52. 00	15
	15	14
	30	13
	03' 45	12
	00	11

5' 15" - - - 10
30" - - - 8
45 - - - 7
4' 00 - - - 7

#23 - Arsenious acid, Cl reb

nothing

4h	15' 00"	2 ch
	16' 00"	1 "

Neg. take immediately
blackened.

	5	0 discharge
	10	0 "
	20	1 "
	30	1 "
	40	

#24 - Zinc [illegible]

24 left nothing
31 inj. 05

4h	15' 00"	16 ch
	17 00	14 "
	25	13 "
	30	5	16 disch
	35	14
	40	13
	45	13
	50	17
	55	13
30'	00	11
	15	8
	30	7
	45	6
30'	00	5
	15	5
	30	5
	45	5
32	00	2
	15	4
	20	2
	45	0

very little
change
[illegible]

25 – Citric acid

ch & red

32 left	nothing	4h	39' av. 4 ch
24 left			49' av. 4 "
			49 - - 0 lis.
geopinen off freely from neg. plate.			10 - 0
			20 - 0
			30 - 0
			40 - 0

26 – Sulph. of am. & Sulph. ferric

	nothing	4h	50' av. 13 ch
Hitch pp found			51 av. 14 "
		5h	av. 20 - 72
			9 - 160 lis.
			10 - 150
			20 - 45
			30 - 27
			40 - 17
			50 - 14
		(1)	01 av. 13
			15 - 11
			30 - 10
			45 - 10
		(2)	02 av. 9
			15 - 9
			30 - 9
			45 - 9
		(3)	03 - av. 9

ch & red

27 – Acetate of am. & Pic. acc. SC

19 left	nothing	5h	05' av. 11 ch
20 left			06 av. 16 "
			15 av. 1 "
geopinen off lit lightly			15 - 5 - 20 lis. ch
			10 - 27
			20 - 20
			31 - 13
			40 - 13
			50 - 12
		16'	20 - 11
			15 - 10
			30 - 10
		17'	45 - 10
			20 - 9

28 – Pyro-gallic acid.

	nothing	5h	20' av. 1° ch
			30 - av. 2 "
			30 - - - 1° lis. ch
			10 - 0
			20 - 0
			30 - 0

19th May '95. Am.

Bethy	All	Time	Defl.
#29 - Formic acid — Ob-r-ch			
42 left stop 44 right "	nothing	9h 05'.00"	3 charge
		15'.00"	2 - stop
Gas given off lightly. Forms a froth		15 - 4	5 discharge on coils
		10 - 4	
		20 - 3	
		30 - 3	
		40 - 3	
		50 - 2	
		16'.00"	2
#30 - Formic acid & Ph. ac. - Ob.			
	8' right	9h 27'.00"	8 ch.
Gas given off more freely than previous test.		28'.00"	7 -
		34'.00"	3 -
		37 - 5	1 discb
		10 - 1	
		30 - 1	
		50 - 0	
#31 - Glycerine & HaCl.			
	nothing	9h 42'.00"	1° ch
		52'.00"	1 "
		52'.00"	1 discb.
		10 - 1	
		20 - 0	
		30 - 0	

Bethy	All	Time	Defl.
#32 - Glycerine & Lactic acid			
36 left 37 right	1° left	9h 55'.00"	23 ch.
		56'.00"	20
Gas freely from respiratory pole.		10h 05'.00"	8 discb
		05 - 8	14
		10 - 12	"
		20 - 12	
		30 - 11	"
		40 - 11	
		50 - 11	
		06'.00"	11
		30 - 10	
		07'.00"	10
		30 - 9	
		45 - 8	
		08'.00"	7
#33 - Glyc. & Ph. ac. Ob.			
Gas from resp. pole.	nothing	10h 11'.00"	8 ch
		21'.00"	1 "
		21 - 7	3 discb
		10 - 3	
		20 - 2	
		30 - 2	
		40 - 2	
		50 - 1	

cd x cd

#34 – Oxalic acid

31 left --	Nothing	10h 34 40"	12 ch
31 right --		34 30"	3 "
		25" 20"	8
Position fl		34" 00"	0
stand			
neg. fl. prior off H.		34	-4 -12 disch.
			10 -10
			20 -8
			30 -6
			40 -5
			50 -4
			60 -3

#35 – Oxalic acid & th. ac.

	Nothing	10h 36 40"	-10 ch
Gas very freely		39 40"	-15
given off by neg.		40 "	7
plate		40	-4 -10 disch.
Photo blackened			10 -9
			20 -8
			30 -8
			40 -7
		49	50 -6
			60 -5

cd x cd

#36 – Tartaric acid

	Nothing	11h 03 40"	-5 ch.
Gas freely given		04 40	-7 "
neg. plate.		13 00	-6
		13 3	-2 dis
		10	-1
		20	-1
		30	1

#37 – Tartaric acid & th. ac. Pl

	Nothing	11h 19' 20"	-14 ch.
Gas as before		20 40"	-9
		29 40"	4
		29	-7 -11 disch.
			10 -9
			20 -6
			30 -4
			40 -3
			50 -3
			60 -2

#38 – Alum –

	2" right	11h 35	-13 ch
Gas given off freely		36	11 "
		45	9
		45 50	-25 disch.
			10 -20
			20 -14
			30 -10
			40 -7
			50 -6
			60 -5

39 alum & Pk. ac.

Col + Col

	1°. right	11h	54' aw"	15 ch
		12h	00 aw"	12 "
	off		09' aw"	11 "
			17' 06	24 dim
			10	3
			20	2
			30	2
			40	1

#40 - Alum & mang. Sulphate

15 left	nothing	12h	15	10 ch
49 right			19 aw	10 "
			25	9 "
			36 7	14 dissol
			10	8
			20	3
			30	2

#44 - Potassium Chlorate

	2° left	12h	31 aw	10 ch
			35 aw	6 "
	off		41	10 dissol
			10	5
			20	4
			30	3
			40	3
			50	2
			aw	2

Col + Col

#41 - Am. Chloride of Iron + Ferr. Sul.

34 left	nothing	2h	11' aw"	20 ch
36 right			12' aw"	17 "
			14' aw"	15 "
			21' aw	12 "
			21' 00	
			10	95
			20	90
			30	86
			40	77
			50	70
		(1)	22 aw	62
			15	56
			30	49
			45	45
		(2)	23 aw	43
			15	41
			30	39
			45	37
		(3)	24 aw	35
			15	33
			30	32
			45	31
		(4)	25 aw	31
			15	30
			30	29
			45	29
		(5)	26 aw	28
			30	27
		(6)	27 aw	26
			30	25
		(7)	28 aw	24
			30	24

See p. 202

(7)	29' aw"		23
	30"		22
(9)	30' aw"		21
(10)	31' aw"		20
	30"		19
(11)	32' aw"		18
	30"		18
(12)	33' aw"		17
	30"		17
(13)	34' aw"		17
	30"		16
(14)	35' aw"		16
	30"		16
(16)	36 aw		15
	37' aw"		15
(18)	38' aw"		15
	39' aw"		14
	40 aw"		14
(20)	41 aw		14
	42' aw"		13
(22)	43' aw"		13
	44' aw"		13
(24)	45' aw"		13
	46 aw"		12

#41 "B" Sum. Alt. of Sc. 10 pm. Zu 50, 4, 10 pm 4, 0 mg.

Time	Defl.	Time	Defl.
3h 03' 00"	-5 charge	3h 24' 00"	-5 charge
04 00"	4½ "	25' 00"	4½ "
13' 00"	4 "	34' 00"	4 "
13' -- 5	-66 disch	34' -- 5	-70 discharge
10	-64	10	-68
20	-62 "	20	-64
30	-60	30	-61
40	-51	40	-50
50	-42 "	50	-42
(2) 14' -- 00	-36	(1) 35' -- 00	-37
15	-31	15	-33
30	-26	30	-27
(2) 15' -- 45	-33	45	-25
60	-22	6 36' -- 00	-23
15	-21	15	-21
30	-20	30	-20
(3) 16' -- 45	-19	45	-20
60	-19	(2) 37' -- 00	-19
15	-18	15	-19
30	-18	30	-18
(4) 17' -- 00	-17	(4) 38' -- 00	-17
30	-17	30	-17
(5) 18' -- 00	-16	(5) 39' -- 00	-16
30	-16	30	-16
(6) 19' -- 00	-15	(6) 40' -- 00	-16
30	-15	30	-15
(7) 20' -- 00	-15	(7) 41' -- 00	-15
30	-14	30	-15
(8) 21' -- 00	-14	(8) 42' -- 00	-15
15	-13	30	-14
30	-12	(9) 43' -- 00	-14
45	-9	30	-13
(9) 22' -- 00	-5	45	-11
30	-2	(10) 44' -- 00	-9
		30	-7
		(11)	

#41 "B" (new solution) Lin & Lin

Time	Defl.	Time	Defl.
3h 47' -- 00"	4½ charge	4h 18' 00"	4½ charge
48 -- 00"	4½ "	19 00"	4 "
57' -- 00"	3½ "	28' -- 00"	3½ "
57' -- 5	-70 discharge	28' -- 5	-90 disch
10	-68	10	-72
20	-62	20	-66
30	-48	30	-62
40	-45	40	-66
50	-43	50	-59
(1) 58' -- 00	-41	(1) 29' -- 00	-57
15	-39	15	-52
30	-37	30	-47
45	-35	45	-46
(2) 59' -- 00	-34	(2) 30' -- 00	-38
15	-33	15	-36
30	-31	30	-34
45	-29	45	-32
(3) 60 -- 00	-28	(3) 31' -- 00	-31
15	-27	15	-30
30	-26	30	-28
(4) 01' -- 00	-24	(4) 32' -- 00	-26
30	-22	30	-25
(5) 02 -- 00	-20	(5) 33' -- 00	-23
15	-18	15	-21
30	-14	30	-20
(6) 45	-10	(6) 34' -- 00	-18
15	-0	15	-14
		30	-10
		45	-6
		(7) 35' 00	-3
		15	-1

232 #41 "B" — Copper-Copper

Time	Defl.	Time	Defl.
5h 00' 00"	4 charge	5h 19' 00"	4 charge
01 00"	3 "	20 00"	3½ "
10 00"	3	29 00"	3½ "
20 00"	100 disch.	29 00"	6
10	75	30	113 disch.
30	57 "	10	115
30	45	20	69
40	38	30	52
50	33	40	43
(1) 11h 00	31	50	39
15	29	(1) 30 00	36
30	27	15	33
45	26	30	30
(2) 12 00	25	45	28
15	24	(2) 31 00	26
30	23	15	24
45	22	30	23
(3) 13 00	21	45	22
15	21	(3) 32 00	22
30	20	15	21
(4) 14 00	19	30	21
30	18	(4) 33 00	20
(5) 15 00	18	30	19
30	17	(5) 34 00	19
(6) 16 00	17	30	18
30	17	(6) 35 00	17
(7) 17 00	16	30	17
15	15	(7) 36 00	16
30	14	15	15
(8) 18 00	13	30	14
45	11	45	13
15	9	(8) 37 00	11
30	6	15	8
45	2	45	6
		9h 38 00	4

5 #41 "B" — Iron-Iron — 20 Ley cells

233

Time	Defl.	Time	Defl.
9:15 am.	4½ charge	9h 45 00"	4½ charge
16 "	4½ "	49 00"	4½ "
25 00	4½ "	50	4
25 6	52 disturbance	55 5	40 disch
26	44	10	36
29	36	30	28
30	30	35	22
40	26	40	20
50	24	49	18
(1) 26 00	22	(1) 50 00	17
15	20	15	16
30	15	30	15
45	17	45	14
(2) 27 00	17	(2) 00 00	14
15	16	15	13
30	16	30	12
45	15	(3) 01 00	11
(3) 28 00	15	15	11
15	15	30	10
(4) 29 00	14	(4) 02 00	10
30	14	30	10
(5) 30 00	14	(5) 03 00	9
30	13	30	9
(6) 31 00	13	(6) 04 00	9
30	12	(7) 05 00	9
(7) 32 00	12	30	8
30	12	(8) 06 00	8
(8) 33 00	11	(9) 07 00	8
30	11	(10) 08 00	8
(9) 34 00	10		
35	10		
(13) 38 00	4		

234 #41 B — Silver Wilson

10h	17' 00"	4	charge	10h 55' 00"	3½ charge
	27' 00"	3½	"	11h 05' 00"	3 "
	27		Lisch.	05'	lisch
	10	1.50		10	1.50
	20	82		20	1.20
	30	60		30	80 "
	40	45		40	55
(1)	50'	40		50'	45
	00	36		(1) 06	00 43
	15	33		15	39
	30	30		30	36
(2)	59'	00	26	45	33
	15	26		(2) 07'	00 31
	30	23		15	30
	45	22		30	29
3.)	30'	00	21	45	28
	15	20		(3.) 08	00 25
	30	20		15	25
	45	19		30	24
(4)	31'	00	19	45	23
	30	18		(4) 09	00 22
(5)	31'	00	18	30	22
	30	18		(5) 10	00 21
(6)	33'	00	17	30	20
	30	17		(6) 11'	00 19
(7)	34	00	16	15	17
	15	15		20	15
	30	12		30	10
	45	9		40	7
(8)	35'	00	7	(7) 12	00 5
	30	5		00	2
9'	36	00	3		

#41 B, — Lisc & Lisc 235

12h	05 P.M.		8	charge	
	15		7½	"	
	15	7	3	lis	
	10	2			
	30	2			
	30	2			
	40				
	50				
	00				

#41 B, — Tucka & Tucka,

12h	32 00"	3	charge	1h	01 00"	3½	charge
	34 00"	3	"		11 00"	3	"
	34	8	37	destroy	11	5	42	lisch.
	10		37			10	39
	20		26			20	23
	30		15			30	19
	40		24			40	17
	50		23			50	16
1)	35'	00	23		(1)	12'	00	13
	15		22			15	13
	30		22			20	13
	45		21			25	12
2.)	36'	00	20		(2.)	13'	00	10
	30		20			30	12
(3)	37	00	19		(3)	14	00	10
	30		18		(4)	15	00	13
(4)	38	00	17			30	13
(5)	39	00	17		(5)	16	00	13
(6)	40'	00	16			30	13
(7)	41'	00	15		(6)	17	00	12
(8)	42	00	14			30	12
(9)	43	00	13		(7)	18	00	12
(10)	44'	00	12		(7)	19	00	12
					(9)	20	00	11

41 - "B" Carlton & Carlton

1h	55'	00"	-3°	charge	3h	24'	00" -8° charge
2h	05'	00"	-2°	"		34'	00" -2 "
	05'	5	-100	disch		34'	5 -150 disch
		10	-95				10 -130
		20	-85				20 -80
		30	-71	"			30 -63
		40	-35				40 -58
		50	-33				50 -38
(1)	06'	00	-18		(1)	35'	00 -26
		15	-14				15 -15
		30	-12				30 -12
(2)	07'	00	-8	"			45 -11
		15	-7		(2)	36	00 -20
		30	-6				15 -9
		45	-5				30 -7
(3)	08'	00	-4				45 -6
		15	-4	"	(3)	37	00 -5
		30	-3				15 -5
							30 -4
							45 -3

41 - "B" - Autumn & Autumn

3h	03'	00"	-8½ ch.
	13		1 "
	13	5	17
		10	14
		20	3
		30	2

41 - "B" - Lear & Leach

3h	36'	00"	-4 ch.	3h	49'	00"	-4 charge
	36'	00"	-2 "		50'	00"	-3 "
					50'	00"	-1½ "
	36	5	-100 disch		59'	6	-140 disch
		10	-95			10	-102
		20	-63			20	-90
		30	-60			30	-67
		40	-58			40	-57
(1)	37'	00	-56			50	-51
		15	-55	(1)	00	00	-45
		30	-48			15	-45
		45	-39			30	-42
(2)	38'	00	-31			45	-35
		15	-25	(2)	01	00	-32
		30	-21			15	-26
(3)	39'	00	-18			30	-22
		30	-16			45	-18
		30	-14	(3)	02	00	-11
		50	-8			10	-4
		60	0			15	-1
						20	0

Cadmium & Cadmium

#43 – Arsenate of Strychnine & Sulph

Port Tray	Cell	Time	Depth
55 left – 59 right –	nothing	4h 36' av –	25 charge
		37' av –	27 "
		38' av –	25 "
		40' av –	33 "
		46' av –	29
		46 – – 5	130 disch
		10	125
		20	115
		30	100 "
		40	62
		50	41
		(1.) 49' – 00	32
		15	23
		30	19
		45	17
		(2.) 47 – 00	16
		15	15
		30	14
		45	14
		(3.) 49' – 00	13
		(4.) 50' – 30	13
		00	12
		30	12
		(5.) 51' – 00	12
		30	12
		(6.) 52' – 00	11
		30	11
		(7.) 53' – 00	11

Gas given off freely from surf: plate

Cadmium & Cadmium

#45 – Bromin Chl. & Bromp. Chl.

	nothing	4h 59' 00' – 25 charge
		5h 00' av – 24 –
		07 – av – 17 –
		07' 45 – 20 disch
		10 – 21
		20 – 20 "
		30 – 17
		40 – 23
		50 – 20
		(1.) 08' – 00 – 17
		15 – 14
		30 – 11
		45 – 7
		(2.) 09' – 00 – 5
		15 – 7

Gas given off freely from surf: plate

#46 – Iodiphide of Iron

31 left 33 right	nothing	5h 13' av – 11 ch.
		14 av – 9 –
		23 av – 9
		23 – 3 – 3 disch.
		10 – 3
		20 – 2
		30 – 2
		40 – 1
		50 – 1

a little gas given off

Lead & Lead — Thursday 21st May 1914

240 Sulphuric acid 10 pms. H2O-1000 grms.

Time	Defl.	Time	Defl.
9h 25' 00"	3½ charge	9h 44' 00"	3½ ch.
26 00"	3	45 - 00	3
35 - 00	2½ "	54 - 00	2½ "
35' - 5'	40 disch	54	3 50 disch
10	12	10"	31
20	9	20	13
30	5	30	20
40	3	40	9
50	2	50	8
(1) 36' - 00	2	(1) 55' - 00	7
15	1½	15	6
		30	6
		45	5
		(2) 56 - 00	5
		15	4

3rd B charge

Time	Defl.
10h 29' 00"	3½ charge
29 00"	3 "
37 - 6	25 disch
10	15
20	12
30	9
40	8
(1) 28' - 50	7
00	6
15	5
30	5
45	5
(2) 29' - 00	4
15	4
30	4
45	4
(3) 30' - 00	3

41 - B (fresh solution) (Phenol) — Cadmium (-) 19 Tickle (+) — 241

Time	Defl.	Time	Defl.
10h 59' - 00"	4 charge	11h 24' 00"	5 ch.
11h 07 - 00"	5 "	34 - 00"	3½ "
07 - 5	60 disch.	34 - 04"	40
10	46	10	36 disch
20	38	20	32
30	37	30	31
40	35	40	30
50	34	50	31
(1) 08' - 00	33	(1) 35' - 00	30
15	32	15	30
30	31	30	30
45	30	45	29
(2) 09' - 00	30	(2) 36' - 00	29
15	19	30	28
30	19	(3) 37' - 00	27
45	19	30	25
(3) 10' - 00	18	(4) 38' 00	22
15	18	30	17
30	18	45	15
45	18	(5) 39 - 00	14
(4) 11' - 00	18	30	13
30	18	45	12
(5) 12' - 00	17	(6) 40 - 00	11
30	17	15	10
(6) 13' - 00	17	30	9
30	16	(7) 41' - 00	9
(7) 14' - 00	16	(8) 42" - 00	9
15	15	(9) 43 - 00	9
(8) 15' - 00	15	(10) 44 - 00	9
30	14	(11) 45 - 00	9
(9) 16' - 00	14	30	8
30	13	(12) 46 - 00	8
(10) 17' - 00	13		
30	12		
(11) 18' - 00	10		
(12) 19' - 00	8		

Cadmium (+) nickel (−)

δ° diff. left on cathode (primary)

12	33	00	−5/c	change	1h	12′	00″ −5/c ch
	38′	00″	−5			13′	00″ −5
	43′	00″	−5	"		20′	00″ −5
	43			Recharge		22	−5 −76 disch
		10	−60				10 −70
		20	−54				20 −68
		30	−45				30 −62
		40	−42				40 −60
		50	−36				50 −56
(1)	44′	00	−31		(1)	23	−00 −49
		15	−27				15 −37
		30	−23				30 −32
		45	−21				45 −27
(2)	45′	00	−19	"	(2)	24′	−00 −24
		30	−19				15 −22
(3)	46	00	−17				30 −21
		30	−17				45 −20
(4)	47′	00	−16		(3)	25′	−00 −20
		30	−16				15 −19
(5)	48′	00	−16		(4)	26′	−00 −19
		30	−16		(5)	27	−00 −18
(6)	49	00	−15	"	(6)	28	−00 −17
(7)	(50)	00	−15	"	(7)	29	−00 −16
(8)	51	00	−15		(8)	30	−00 −15
		30	−14		(9)	31	−00 −15
(9)	52	00	−14		(10)	32	00 −15
(10)	53′	00	−14		(11)	34	00 −14
		45	−13		(12)	35	−00 −13
(12)	55	00	−13		(13)	36	−00 −11
(13)	56	00	−13				15 −10
		30	−12				30 −9
(14)	57	00	−12				45 −8
(15)	58	30	−11		(15)	37	00 −6
(16)	59	00	−10		(16)	38	−00 −2
(17)	60	00	−8				

Cadmium (+) copper (−)

δ° diff. left

2h	24′	00″	−5	change	2h	4	5′ 00″ −5/c change
	32′	00″	−5			5	00″ −5
	32			72 disch		5	8 −80 disch
		10		75			10 −76
		20		64			20 −68
		30		56			30 −69
		40		48			40 −65
		50		48			50 −60
(1)	33	00		38	(1)	59	−00 −56
		15		31			15 −45
		30		28			30 −38
		45		25			45 −34
(2)	34′	00		23	12	00	−00 −30
		15		22			15 −26
		30		22			30 −23
(3)	35′	00		22			45 −22
		30		21	(3)	01	−00 −22
(4)	36	00		21			15 −21
		15		20	(4)	02	−00 −20
(5)	37	00		20			30 −19
		30		19	(5)	03′	00 −19
(6)	38	00		18	(6)	04	−00 −18
		45		15	(7)	05′	00 −17
(7)	39	00		17	(8)	06	−00 −16
(8)	40	00		16	(9)	07	−00 −15
	41	00		15	(10)	08	−00 −14
(10)	42	00		14			30 −13
(11)	43	00		12	(11)	09′	−00 −13
		30		10	(12)	10	−00 −12
		40		9			45 −10
		50		6	(13)	11	00 −9
(12)	44′	00		4			15 −7
		15		2	(14)	12	30 −6
							00 −3

4h 4m "B" = Copper & Cadmium (-)
9° left left

3h	19'	00"	-5	charge
	29	00"	-5	"
	39'	-5	140	dark
		10	-95	
		20	-60	"
		30	-47	
		40	-35	
		50	-35	
(1)	30'	00	-33	"
		15	-30	
		30	-28	"
		45	-27	
(2)	31'	00	-26	"
		15	-25	
		30	-24	
		45	-22	
(3)	32'	00	-21	
		30	-20	
(4)	33'	00	-19	
		30	-19	
(5)	34	00	-16	
		30	-15	
(6)	35	00	-14	
(7)	36	00	-12	
		15	-10	
		30	-8	
		45	-5	
(8)	37	00	-5	

3h	44m	00"	-5	charge
	54	00	-5	"
	54	-6	140	dark
		10	-90	
		20	-64	
		30	-50	
		40	-42	
		50	-35	
(1)	55	00	-35	
		15	-32	
		30	-29	
		45	-27	
(2)	56	00	-25	
		15	-27	
		30	-26	
		45	-24	
(3)	57	00	-22	
		15	-22	
		30	-21	
		45	-20	
(4)	58	00	-20	
		30	-19	
(5)	59	00	-19	
(6)	00	00	-18	
(7)	01	00	-17	
(8)	02	00	-15	
		30	-16	
(9)	03	00	-13	
(10)	04	00	-10	
(11)	05	00"	-5	

Previous one reduced to for 20 minutes

4h	44m	00"	-5	charge
5h	04	00"	-4/5	"
	04'	-7	100	dark
		10	-85	
		20	-72	
		30	-60	
		40	-50	
		50	-43	
(1)	05'	00	-39	
		15	-36	
		30	-34	
		45	-32	
(2)	06'	00	-30	
		15	-29	
		30	-27	
		45	-26	
(3)	07'	00	-25	
		30	-24	
(4)	08'	00	-22	
		15	-21	
(5)	09'	00	-20	
(6)	10	00	-19	
(7)	11	00"	-18	
(8)	12	00	-15	
(9)	13	00"	-17	
(10)	14	00"	-16	
(11)	15	00"	-15	
(12)	16	00"	-15	
(13)	17	00"	-16	
(14)	18	00"	-13	
(15)	19	00	-12	
(16)	20	00"	-10	

5h	00'	15"	-8
		30"	7
	31	00	-5

28 26 Hazy: Cu

41 - "B" - Cadmium (+) & Iron (-)

Time	Left	Time	Right
	Steadily increasing to left		
9h 25' ow	15 change	9h 5' ow	5 change
26 - ow	1/2 "	6' 53 ow	1/2 "
35 ow	1/2 "	10h 01 ow	1/2 "
35' 05	50 decrease	01 - 07	73 decrease
10	76	10	80
20	62	20	72
30	56	30	67
40	45	40	64
50	42	50	62
(1) 36 - 00	38	(1) 02 - 00	60
15	34	15	55
30	31	30	46
45	28	45	39
(2) 37' - 00	27	(2) 03 - 00	34
15	24	15	30
30	25	30	29
38 - 00	23	45	26
30	23	(3) 04 - 00	26
(4) 39 - 00	23	30	25
30	22	(4) 05 - 00	23
(5) 40 - 00	21	30	22
(6) 41 00	19	(5) 06 - 00	21
(7) 42 00	17	30	20
(8) 43 - 00	15	(6) 07	00
30	13	(7) 08 - 00	18
(9) 44 - 00	10	(8) 09 - 00	16
30	5	(9) 10 - 00	14
45	3	30	12
		(10) 11 - 00	10
		30	7
		45	5
		(11) 12 - 00	3

41 - "B" - Cadmium (-) & Iron (+)

Time	Left	Time	Right
10h 28' ow	4 1/2 change	10 - 49 ow	5 change
29 ow	4 "	50 ow	4 1/2 "
30 - 00	4 "	59 ow	4 "
30 - 6	53 decrease	59 - 23	60 decrease
10	49	10	65
20	40	20	61
30	35	30	54
40	32	40	50
50	29	50	47
(1) 34' - 00	27	(1) 00 - 00	45
15	26	15	23
30	25	30	21
45	23	45	20
35 - 00	22	(2) 01 - 00	19
30	20	15	15 "
(2) 36 - 00	18	30	15
30	17	(3) 02 - 00	17
(3) 37 - 00	17	30	15
30	16	(4) 03 - 00	15
(4) 38 - 00	16	30	14
30	15	(5) 04 - 00	14
(5) 39 00	15	30	13
(6) 40 - 00	15	(6) 05' 00	13
(7) 41 00	12	(7) 06 - 00	12
(8) 42 00	12	(8) 07' 00	12
(9) 43 00	10	(9) 08 - 00	11
(10) 44 00	6	(10) 09 - 00	11
30	2	(11) 10 - 00	10
		(12) 11 - 00	10
		(13) 12 - 00	10
		30	9
		(14) 13 - 00	8
		(15) 14 - 00	6
		30	4

41 B" (over solution) Calcium (+) & Silicon (−)

11h	30'	00"	4½ charge		11h	49'	00" 4 ch
	33	00"	4 "			50	00" 3½
	37	00"	3½ "			59	00" 3
	32'	06	72 disch			49	06 72 disch
		10	67				10 68
		20	62 "				20 63
		30	57				30 59
		40	48				40 54
		50	39				50 46
(1)	33	00	32 "		(1)	50	00 39
		15	31				15 33
		30	29				30 30
		45	26				45 27
(2)	34'	00	24		(2)	01	00 25
		15	23				30 22
		30	22		(3)	02	00 21
		45	21		(4)	03	30 20
(3)	35	00	20				00 19
		30	19				30 18
(4)	36	00	18		(5)	04	00 18
(5)	37	00	17				30 17
(6)	38	00	17		(6)	05	00 17
(7)	39	00	16		(7)	06	00 16
(8)	40	00	15		(8)	07	00 16
(9)	41	00	15		(9)	08	00 15
(10)	42	00	15		(10)	09	00 15
(11)	43	00	12		(11)	10	00 15
		30	8		(12)	11	00 14
(12)	44	00	3				30 13
							00 12
							30 10
					13 (12)		00 8
							15 7
							30 3

Primary working against

11h left – primary / 16h left

41 B" Calcium (−) & Silicon (+)

12h	30'	Pm	3½ ch		1h	59	00" 4 chg
	33	"	3 "			00	00" 3
	32	"	3 "			09	00" 3
	32	00	150 disch			59'	00
		10	150				10 150 disch
		20	150				20 150
		30	62				30 32
		40	48 "				40 48
		50	39				50 48
(1)	33	00	36		(1)	10	00 27
		15	31				15 36
		30	29				30 31
		45	27				45 28
(2)	34	00	26		(2)	11	00 26
		15	25 "				15 24
		30	24				30 23
		45	22		(3)	12	00 21
(3)	35	00	21				30 19
		30	19		(4)	13	00 17
(4)	36	00	18				30 15
(5)	37	00	16 "		(5)	14	00 14
(6)	38	00	15				30 13
(7)	39	00	15		(6)	15	00 13
(8)	40	00	16		(7)	16	00 13
(9)	41	00	14		(8)	17	00 12
(10)	42	00	13		(9)	18	00 12
(11)	43	00	13		(10)	19	00 12
(12)	44	00	13		(11)	20	00 12
(13)	45	00	13		(12)	21	00 11
(14)	46	00	12				
(15)	47	00	12				

Primary working against.

12h left – primary / 10h right

"B" — Cadem. (+) & Kin (−)

7° left (fermion)

36	14'	ow	4 ch.
	15'	ow	4
	24	ow	4 "
	24		85 disch
		10	84
		20	47 "
		30	45
		40	39
		50	35 "
(2)	25	00	33
		15	31
		30	37
		45	27
(3)	26	00	36 "
		15	25
		30	24
(3)	27	00	23
(4)	28	30	22
(5)	29	00	21
(6)	30	00	19
(7)	31	00	18
		30	17
(7)	32		14
		30	9
		45	6
0	33	00	3

5/90
18

36	49'	ow	4 1/2 ch
	50	ow	4 1/2 "
	59	ow	4 "
	59		95 disch
		10	78 "
		20	72
		30	66
		40	59
		50	45
(1)	50	00	43
		15	38
		30	33
		45	30
(2)	01	00	28 "
		15	27
		30	26
(3)	02	00	26
		30	25
(4)	03	00	24
(5)	04	ow	23
(6)	05	ow	21
(7)	06	00	20
		30	15
		45	16
(7)	07	ow	13
		15	9
(9)	07	30	3
		45	0

24th May. 1885. Cairo

Ammonium Chloride 10 grms } Cadmium (+)
Cadmium Chloride 10 " } Zinc (−)
Water - - - 100 "

Time	Deflection	Time	Defl.
	12° left primary = 80° charge.		
10h 25′ 20″	92 on circuit	10h 41′ 20″	92 on circuit
27′ 20″	92 "	51′ 20″	"
35′ 20″	92 (= 4% on this)	51′	4 13 disch. 10
35′	5 12 discharge		10 10 circ.
10	9		20 7 5
20	5		30 4
30	4		40 4
40	3		50 3
50	3	52′	20 3
36′	20 2		15 3
15	2		
45	2		
37′	20 1		
38′	20 1		
39′	20 0		

The cadmium sulphate gradually precipitated. At first was colourless.

#41 B

~~14~~° left primary = for 20° charge
13 reading = 20×4 = 80°

11h 34′ 20″ — 31° defl.
44′ 20″ — 29 "

44 ~~20~~
10 — 3 disch
20 — 2
30 — 2
40 — 1
50 —

#41 B Cd (+) & Zn (−) for 40° charge

11h 55′ 20″	47° defl.	12h 13′ 20″	49° defl.
12h 05′ 20″	47° "	14′ 20″	47 "
		23′ 20″	47
05′	10 80 disch	25′	5 80 disch
20	62	10	74
30	56	20	68
40	50	30	64
50	42	40	58
		50	45
(1) 06′	20 38	(1) 26′	20 43
15	34	15	36
30	30	(2) 25′	20 29
45	27	30	25
(2) 07′	20 24	(3) 26	20 17
(3) 08′	20 20	30	15
(4) 09′	20 18	(4) 27	20 14
(5) 10′	20 16	15	11
		30	8
	13	45	5
30	9	60	1
45	6		
60	2		

#50 – Carbonate of Potash. Cal & Cl.

Bottling	Cal	Time	Expl.
38 left. 11 right	Nothing	9h 10' 00" – 5 on strip	
		20' 00" – 6 " "	
		29' 00" – 10 " "	
		39 – 10 on cal	
		15 – 5	
		25 – 2 disch.	
		30 – 2	
		35 – 1	

#51 – Bicarbonate of Potash. Cal & Cl.

Bottling	Cal	Time	Expl.
11½ right		9h 35' 00" 14 on strip	
		37' 00" – 5 " "	
very little res. given off.		47' 00" – 3 " "	
		47 – 7 disch	
		10 – 4 "	
		20 – 2	
		30 – 1 "	
		40 –	

#52 – Sulphite of Potassium. Cal & Cl.

Bottling	Cal	Time	Expl.
Nothing		9h 56' 00" – 21 on strip	
Gas given off freely from very pale		57' 00" – 17 " "	
		10h 06' 00" – 15 " "	
Gelatinous coating formed on fracture plate.		06 – 6 – 12 disch	
		10 – 7	
		20 – 3	
		30 – 2	
		40 – 1	

Cal & Cl.

#53 – Bi-sulphite of Potash. 255

Bottling	Cal	Time	Expl.
Nothing		10h 17' 00" – 26 charge	
		18 00" – 23 "	
very little gas given off.		27 00" – 20 "	
		37 – 5 – 31 disch	
		10 – 13	
very pale. Thickness slightly.		20 – 9 "	
		30 – 7	
		40 – 5	
		50 – 4 "	
		20 – 00" – 4	
		15 – 3	

#54 – Bromide of Potash.

Bottling	Cal	Time	Expl.
32 left 31 right	Nothing	10h 31 00" – 15 charge	
		31 00" – 13 "	
Gas very freely given off (–)		40 00" – 12 "	
		40 – 3 – 30 disch	
		10 – 25	
		20 – 20 "	
		30 – "	
		40 – 6	
Heavy white precip.		41' 00" – 5	
Tube formed around bottom of fracture.		00" – 1	
		15 – 4	
		30 – 2	
Chokeade.		42 – 00" – 3	

Colored

#55 – Permanganate of Potass.

25 left	Nothing	10h 45' 00"	-5 obs.
30 right		55' 00"	-6 "
		55'	-3 .21 desch
		00'	-7
		20'	-2
		30'	-0
		40'	

#56 – Sulphocyanide of Potass

	Nothing	11h 03' 00"	-12 ch
		08 00"	-11 "
		13 00"	
		13'	-4 .9 desch
		10'	-3
		20'	-2
		30'	-1
		40'	

#57 – Ferro-cyanide of Potass.

	Nothing	11h 20' 00"	-5 ch.
very little		30 00"	
plus given off.		30	-4 .20
		10'	-9 desch
		20'	-8
		30'	-1
		40'	

Colored

#58 – Hypo-sulph. of Potass

	1° left	11h 35'	-21° left.
		30'	-19 "
		25'	-15 "
		45'	-7 .30 desch.
		10'	-22
		20'	-10
		30'	-6
		40'	-4
		50'	-3
		00'	-2

#59 – Arsenate of Potass

	1° left	11h 50 00"	-4° ch.
		12 00 00"	-11 "
See from back of plate		04'	-7 .16 desch
		10'	-9
		20'	-6
		30'	-4
		40'	-3
		50'	-2

Calotypes
Precipitate on
Cooling ground
arsenic position
plate.

Cadmium

#60 – [illegible] of Rubens & Kurlbaum's [illegible]

30 left – nothing.
32 right

1h 17' Rec.	-9' [illegible]
27 "	0 "
27 – "	45 circuit
10	12
20	6
30	4
40	3
50	2

a little gas from both plates.

Cadmium & Sodium.

#41 "B"

Time	Reflections on circle		Time	Reflections on circle	
12h 58' 00"	-40°	change	1h 13' Rec.	-40°	change
57 00	-40°	"	20 "	-40°	"
1h 06 00	-40°	"	21' --- 6	-70	circuit.
06 - 8	-71	discharge	10	-67	
10	-65		20	-57	
20	-53		30	-52	
30	-45	"	40	-44	
40	-41		50	-38	
50	-33		(1) 2' --- 20	-35	"
59' -- 00	-31	"	15	-32	
15	-28		30	-30	
30	-25		45	-28	
45	-22		(2) 3' 00	-26	"
2h 00	-19	"	15	-24	
15	-15		30	-22	
30	-9		(3) 3' 45	-18	
45	-2		15	-12	
50	-0	"	30	-5	
			40	-0	

#41 "B" (same sol. as before) Cd & Cd

1h	53'	mv"	80	charge	3h	11'	mv" 60 charge
3h	03	mv"	60	"		31	mv" 60 "
	03		86	disch.		31	86 disch.
			70				70
			60				60
			48				63
			44				54
			40				46
			30				29
(1)	04'		30	37	(1)	32	30 35
			15	33			15 32
			30	30			30 30 "
			45	27			45 28
(2)	05'		30	25	(2)	33	30 27
			15	23 "			15 26
			30	23			30 25
			45	22			45 24
(3)	06		30	21	(3)	34	30 24
			30	19			15 23
(4)	07'		30	18	(4)	35	30 23
			30	17			30 22
(5)	08'		45	15	(5)	36	30 21
			30	13			30 20
			10	10	(6)	37	30 17
			15	8			30 16
			30	5			30 12
			45	2			45 7
					(7)	38	30 6
							30 1

#41 "B" (same solution) Cd & Cd

3h	57'	mv"	80	charge	3h	09'	mv" 70 charge
4h	01	mv"	70			19	mv" 70 "
	01		76	disch.		19	84 discharge
			70				74
			63				70
			56				61 "
			51				52
			44				44
			38				40
(1)	02		30	38	(1)	20	30 35
			15	34			15 32 "
			30	32			30 29
(2)	03'		30	30	(2)	21	30 26
			15	26			15 25
			30	24			30 24
(3)	04		30	22	(3)	22	30 23
			30	21			15 23
(4)	05		30	21	(4)	23	30 22
			30	20			30 21
(5)	05'		30	19	(5)	24	30 20
			15	17			30 19
			30	15	(6)	25	30 18
(6)	07		45	13			15 17
			30	10			30 15
			15	6			45 13
			30	3	(7)	26	30 10
							15 7
							30 5
							45 3

41 — 15 (same solut.) — d 9 red

4h	07'	ow	— ow charge
	17'	ow	— ow "
	17'	— 6	73 disch.
		10 —	74
		20 —	67 "
		30 —	62
		40 —	50
		50 —	46
(1.)	18	— 00 —	42
		10 —	38
		20 —	34
		45 —	32
(2.)	19	— 00 —	30
		10 —	28
		20 —	26
(3)	20	45 —	25
		30 —	24
(4)	21	— 00 —	24
		30 —	24
(5)	22	— 00 —	23
		30 —	23
(6)	23	00 —	23
		30 —	22
(7)	24	— 00 —	22
		30 —	20
(8)	25	00 —	19
		30 —	18
(9)	26	00 —	17
		30 —	15
(10)	27	00 —	13
		15 —	10
		30 —	7
		45 —	5
(11)	28	00 —	3

4h	31'	ow	— ow charge
	41'	ow	— ow "
	41	— 6	20 disch
		10 —	24
		20 —	26
		30 —	30
		40 —	40
		50 —	51
(1)	42	00 —	44
		15 —	39
		30 —	34
		45 —	30
(2)	43	00 —	28
		15 —	27
(3)		30 —	26
(4)	44	00 —	25
		30 —	25
(5)	45	00 —	24
		30 —	24
(5)	46	00 —	23
(6)	47	00 —	23
(7)	48	00 —	22
(8)	49	00 —	21
(9)	50	00 —	20
		30 —	19
(10)	51	00 —	15
		30 —	15
(11)	52	45 —	13
		00 —	11
		15 —	9
		30 —	7
		45 —	6
12	53	00 —	4

41 — 15 (same solut.) — d 9 red

4h	59'	ow	— ow charge
5h	09'	ow	— 20
	09	— 7	disch
	10	— 6	
	20	— 5	"
	30	— 5	
	40	— 4	
	50	— 3	
6	15	— 00	3

Sunday, January 25th Day

4h	37'	ow	— 20 charge
	37	— 9	disch.
	10	— 9	
	20	— 9	"
	30	— 4	
	40	— 4	
	50	— 3	
	00	— 3	

26th May Contd. — carried

Star "B" (Sun & ☾)

9h	44' 00"	-80 charge
	54' 00"	-80 "
	54'	-7" -80 disch.
		10 -78
		20 -73
		30 -67
		40 -63
		50 -58
(1)	55' -- 00	-49 "
		15 -44
		30 -38
(2)	56' -- 00	-35
		30 -30
(3)	57' -- 00	-27
		30 -25
(4)	58' 00	-23 "
(5)	59' 30	-21
		-18
		30 -15
(6)	60' -- 00	-11
		30 -5
		30 -5
		45 -2 "

10h	10 00"	-85 ch.
	20 00	-80 "
	20	-3 -80 disch.
		10 -25
		20 -51
		30 -76
		40 -65
		50 -65
(1)	21' -- 00	-62
		15 -59
		30 -52
		45 -45
(2)	22' -- 00	-38
		15 -35
		30 -33
(3)	23 00	-29
		30 -26
(4)	24 00	-24
		30 -23
(5)	25 00	-22
		30 -20
	26' 00	-17
		30 -14
		45 -12
(7)	27'	-10
		15 -8
		30 -6
		45 -4
(8)	28' -- 00	-3

Star "B" (Sun)

10h	35' 00"	-100 ch.
11h	35' 00"	-100 "
	35'	-5 -80 disch.
		10 -62
		20 -58
		30 -54
(1)	36' -- 00	-54 "
		15 -50
		30 -46
		45 -43
(2)	37 -- 00	-42
		15 -41
(3)	38 -- 00	-39
		30 -35
(4)	39 -- 00	-34
		30 -33
(5)	40 -- 00	-32
(6)	41 -- 00	-30
(7)	42 -- 00	-27
(8)	43' -- 00	-25
(9)	44 -- 00	-21
		30 -16
		45 -13
(10)	45' -- 00	-10
		30 -7
		00 -5

11h	39' 00"	-100 charge
	49 00"	"
	49	-- discharge
		10 --
		20 --
		30 --
		40 --
		50 --
(1)	50' -- 00	--
		15 --
		30 --
		45 --
(2)	51' -- 00	--

G. M. T. when taken.

Lin & Lin

"B" (newsolution)

12h	12' PM	100 charge
	35' 00"	94 "
	32' 00"	91 discha
	10	72
	20	63 "
	30	58
	40	54
	50	51
(1.)	38' 00	49
	15	46
	30	44
	45	43
(2.)	24' 00	42
	15	40
	30	38
	45	35
(3.)	25' 00	33
4	35' 30	29
	00	35
	30	32
5.	27' 00	20
	30	19
(6.)	21' 00	19
	30	18
(7.)	29' 00"	17
(8.)	30' 00"	15
(9.)	31' 00"	13
(10.)	32' 00"	10
	30	7"
(11)	33' 00"	6"
	15"	3

12h	45' 00"	100 charge
	57' 00"	100
	58' 00"	50 "
	55'	51 disch decid
	10	55
	20	54
	30	52
	40	56
	50	57
(1.)	55' 00	56
	15	54
	30	52
	45	48
(2.)	57' 00	43
	15	39
(3.)	30	36
	00	32
(4.)	59' 30	29
	00	26
(4.)	30	24
	00	22
	30	20
(5.)	01' 00	19
(7.)	02' 00	17
(8)	03' 00"	15
(9)	04' 00	13
	30	10
(10)	05' 00	7
	30	5
(11)	06' 00	3

Lin & Lin

"B"

1h	13' 00"	70 charge
	33 00"	80 "
	23	105 disch
	10	100
	20	95
	30	85
	40	82
	50	57
(1.)	24' 00	56
	15	52
	30	45
	45	44
(2.)	25' 00	40
	15	37
	30	34
(3.)	26' 00	32
(4.)	27' 30	30
	00	25
	30	26
(5.)	28' 00	25
	30	23
(6.)	29' 00"	22
(7.)	30' 00"	20
(8)	31' 00"	18
	30	16
(9)	32' 00	10
	30	7
(10)	33' 00	3

1h	41' 00"	70 charge
	51' 00"	75 "
	51'	105 discharge
	10	100
	20	98
	30	85
	40	65
	50	63
(1.)	52' 00	61
	15	57
	30	56
	45	47
(2)	53' 00	43
	15	39
	30	35
(3.)	54' 00	30
	30	25
(4)	55' 00	26
	30	24
(5)	56' 00	23
	30	21
(6)	57' 00	20
(7)	58' 00	17
(8)	59' 00	14
	15	11
	30	8
	45	5
(9)	60' 00	4

3h	17' 00"	60	charge
	27 00	60	"
	27 -- 6	75	disch
	10	76	
	20	73	"
	30	72	
	40	71	
	50	69	
(1.)	28' -- 00	64	"
	15	59	
	30	53	
	45	48	
(2.)	29' -- 00	44	
	15	42	
	30	41	
(3)	30' -- 00	39	"
	30	37	
(4.)	31' -- 00	34	
	30	31	
(5)	32 -- 00	28	
	30	25	
(6)	33 -- 00	21	
	30	15	
	45	11	
(7)	34' -- 00	9	
	15	7	
	30	6	
	45	5	

3h	45' 00"	60	charge
	55 00	60	"
	55 -- 7	82	disch
	10	78	
	20	70	
	30	66	
	40	66	
	50	61	
(1.)	56 -- 00	59	
	15	56	
	30	50	
(2)	57' -- 00	46	
	30	43	
(3)	58' -- 00	42	
	15	38	
	30	35	
(4)	59' 00	33	
	30	30	
(5)	4' 00	28	
	30	24	
	45	20	
(6)	01 -- 00	15	
	15	11	
	30	5	
	45	6	
(7)	02' -- 00	5	
	15	4	

3h	19' 00"	40	charge
	29' 00	40	
	31 -- 5	72	disch
	10	67	
	20	64	
	30	61	
	40	55	
	50	49	
(1)	30' -- 00	46	
	15	43	
	30	38	
	45	35	
(2)	31' -- 00	33	
	15	32	
	30	30	
(3)	32 -- 00	26	
	15	18	
	30	12	
(4)	33' 00	6	
	30	3	

3h	35' 00"	40	charge
	45 00	40	
	45 -- 4	70	
	10	66	
	20	62	
	30	57	
	40	55	
	50	51	
(1.)	49' -- 00	46	
	15	42	
	30	39	
	45	35	
(2)	50' -- 00	33	
	15	31	
	30	30	
(3)	51' -- 00	25	
	30	25	
	45	21	
(4)	52 00	16	
	15	11	
	30	5	
	45	6	
(5)	53' 00	4	

5th 15', 00"	20 chains	
25 - 00"	20	
35 - 00	60 links	
10	55	
20	47	
30	30	
40	10	
50	6	
60	3	

Hedmarchen
Running 27 Chains

9th 31' 00"	20 chains	
31' 00"	20	
31 - 5	50 links	
10	46	
20	40	
30	36	
40	33	
50	29	
(1) 32 - 00	26	
15	23	
20	20	
45	16	
2. 33 - 00	11	
15	5	
50	3	

Wednesday 27th Cont'd

Determination of constant of galvanometer in use in preceding experiments.

Galvanometer in series with external resistance = d

" " " " shunt 5.2 ohms = d_1

" " " " " 10.4 " = d_2

d	d_1	d_2	
66	+3	5.2	right of zero
67	+3	5.2	
65	+3	5.2	
65	+1	5.0	left of zero
65	+1	5.0	
65	+1	5.0	
66	+2	5.1	} means

Then $(S+B) = \frac{R\,d_1}{d-d_1}$

$C = \frac{E}{S+B} = K d$

$\therefore K = \frac{E}{(S+B)\times d}$

where S+B = total resistance of circuit including galvanometer, battery & connections

$S+B = \frac{5.2\times 4.2}{66-4.2} = 9.1$ ohms

$S+B = \frac{10.4\times 2.1}{66-2.1} = 9.2$ ohms

} = 9.15 ohms

$Kd = C = \frac{1.079}{9.15} = .118$ amperes for 66 deflection

$\therefore K = .00175$

$Kd_1 = C_1 = \frac{1.079}{9.15+5.2} = .075$ amperes for 63 defl.

$\therefore K = .00175$

$Kd_2 = C_2 = \frac{1.079}{9.15+10.4} = .055$ amperes for 51 defl

$\therefore K = .00177$

mean value of K = .00175

i.e. d × .00175 = no. of amperes.

exposed surface of tin cheeks
= 1.2 sq inches.

charged with 50 × .00015 amperes for 10"
= .100 amperes

or $\frac{.100}{1.2}$ = .09 per sq inch.

and returns 45 %
= .04 amps per sq in.

14183/4.
G 8
750